REPORT RESUMES

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AN INVESTIGATION OF THE IMPORTANCE OF THE PERSONAL RELATIONSHIP AND ASSOCIATED FACTORS IN TEACHING MACHINE PROCEDURES.

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A "SELF-COUNSELING MANUAL" WAS DEVELOPED TO REPLACE THE STANDARD PERSONAL PRECOLLEGE COUNSELING INTERVIEW. A BRANCHING PROGRAMED TEXT PRESENTED THE FOLLOWING TOPICS TO HIGH SCHOOL SENIORS WHO HAD TAKEN A BATTERY OF ADMISSIONS, GUIDANCE, AND PLACEMENT TESTS--(1) YOUR TEST RESULTS AND SCHOLASTIC ACHIEVEMENT, (2) AREAS OF SPECIALIZATION WITHIN THE UNIVERSITY, (3) SUMMARY OF INTERPRETATION OF YOUR TEST RESULTS, (4) STUDY HABITS AND READING, (5) INFORMATION ABOUT THE UNIVERSITY, (6) YOUR PERSONALITY CHARACTERISTICS AND SUCCESS, AND (7) AREAS OF INTEREST. A TOTAL OF 391 MALES WERE DIVIDED INTO GROUPS WHICH RECEIVED NORMAL COUNSELING, PROGRAMED COUNSELING, OR SIMULATED PROGRAMED COUNSELING. PARTICIPANTS COMPLETED A PRECOUNSELING QUESTIONNAIRE, A POST-COUNSELING QUESTIONNAIRE, A SIMILAR QUESTIONNAIRE AT THE END OF THEIR FIRST SEMESTER, AND A POST-COUNSELING INTERVIEW WHEN IT WAS REQUESTED AFTER PROGRAMED COUNSELING. FINDINGS INDICATED THAT COUNSELING CARRIED OUT BY A PROGRAMED BOOK WAS AS EFFECTIVE AS OR MORE EFFECTIVE IN CHANGING SELF-CONCEPTS THAN NORMAL COUNSELING. IT WAS IMPLIED THAT A PROGRAMED COUNSELING BOOK SUCH AS THAT DEVELOPED IN THIS STUDY COULD DO MUCH TO ALLEVIATE THE CRITICAL SHORTAGE OF TRAINED COUNSELORS AT THE NATIONAL LEVEL. FUTURE RESEARCH WAS SUGGESTED ON AN INVESTIGATION OF PROGRAMED PSYCHOTHERAPY AS COMPARED WITH NORMAL PSYCHOTHERAPY. (JM)

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Final report
May, 1965.

A COMPARISON OF PROGRAMMED AND FACE TO FACE COUNSELING

(An Investigation of the Importance of the Personal Relationship and Associated Factors in Teaching Machine Procedures.)

Grant No. 7-23-1020-170.0

Department of Health, Education, and Welfare

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Student Counseling Service
and
Department of Psychology

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Design of the Study and Procedures in Collection of the Data

The idea of doing counseling by means of a teaching machine in the form of a branching scrambled book seemed initially very problematical, even to the investigators. They recognized that the personal relationship variable would be absent, or nearly so, in a scrambled book and that practically every writer since Freud has made the personal relationship a critical factor in the attitudinal and other learning which occurs in counseling and psychotherapy. It was also recognized that great importance has been attached to the presumed flexibility of the teacher or counselor which is possible in a dyadic relationship. Presumably the tutorial teacher or counselor or therapist adapts what he says and does to the needs, problems, and characteristics of each student or client in a completely individual manner.

Despite these and related problems, the idea of developing and trying out programmed counseling seemed to hold considerable promise in a number of areas.

If a programmed counseling book could be constructed which would be acceptable to students and which would be even reasonably effective in attaining the generally accepted goals of counseling, it would be possible for the first time to design an experiment which would isolate to a high degree the personal relationship variable which purportedly is of great importance in both counseling and psychotherapy. For the first time, too, it would be feasible to compare the teaching of one student by one teacher (in this case, the special teaching involved in counseling), and the teaching of one student by a machine. Similarly, it would be possible to evaluate the significance of the cooperative writing of the programmed counseling manual as a training experience for counselors. Also, if the programmed counseling book were acceptable and effective, a research method would have been created which could be used to investigate a large number of variables involved in counseling, in a more systematic and controlled fashion than had heretofore been possible. The "counselor," that is the counseling book, would be a standard counselor which could be varied at will.

Finally, the programmed book could provide a self-counseling procedure which could be used as a valuable and time-saving adjunct to normal counseling in many high schools and colleges with but few modifications. Counselors could then spend their time with client problems which perhaps the counselors alone could handle most effectively.

For these varied reasons a research program was instituted, the main objectives of which were as follows:

1. To discover whether it is possible to construct a programmed counseling book which can function as an effective substitute for normal face-to-face counseling.
2. To discover whether the personal relationship factor present in normal face-to-face counseling situations and absent, to a very high degree, in a counseling book is an important variable. To the extent that counseling can be looked upon as a teaching situation, it will also be possible to discover whether the personal relationship factor is an important variable affecting teaching effectiveness.
3. To discover whether the live counselor or teacher normally performs in a more flexible manner than an adaptive teaching machine program and how this influences learning.
4. To determine whether participation in the construction of a machine program will measurably and favorably affect the normal counseling subsequently carried out by participating counselors.

1. Nature of Counseling Interviews Studied

The interviews which were utilized in the research were one session counseling interviews conducted with students planning to enter the University of Illinois. These students were given a battery of admission, placement, and guidance tests prior to the interview and came to the campus of the University during the spring or summer prior to their entrance to the University. This type of interview usually covers the interpretation of the results of the interest and aptitude tests in relation to the curriculum plans of the student, information about the University for the new student, and discussion of the student's probable level of achievement and areas of expected difficulty in the University. Other problems or topics are dealt with less frequently depending upon the interests and problems of the individual student. The interviews vary from a half hour to an hour in length. In a very few occasions the interview may last longer than an hour or the student may return for a second interview. All counselors in the project were experienced with this particular type of interview at the University of Illinois.

2. The Four Conditions of Counseling

The four conditions under which counseling took place are described below. Approximately one hundred students participated in counseling under each condition. All interviews were tape recorded.

a. Normal-1 Counseling. The counselor was instructed to carry out his counseling in his normal fashion. These interviews took place during the summer of 1962.

b. Normal-2 Counseling. During the fall and winter of 1962-63 the counselors participated in the construction of a scrambled book program for a "counseling interview" of approximately 45 minutes. This was designed so that it could be substituted for the pre-college counseling interview. After having participated in the writing of this Self-Counseling Manual, the counselors were again instructed to carry out their counseling in their normal manner for students seen under the condition of Normal-2 Counseling.

c. Programmed Counseling. Under this condition the students received counseling by reading the Counseling Manual and did not see a counselor unless they so requested after completing the questionnaire which was given following each interview.

d. Simulated Programmed Counseling. Under this condition the counselors were trained so that they could conduct a counseling interview in which they used the Counseling Manual and followed the order and content of the book in their interview with the student. While they did not read the Counseling Manual word for word to the student, they attempted to follow it as closely as possible. If the student brought up a topic not being discussed, the topic was deferred until the time when it was covered in the Counseling Manual or until after the post-counseling questionnaire when the student could return to see the counselor if he wished.

3. Nature of the Counseling Manual Used in the Research Project

In contrast with most studies of teaching machine procedures, the present research is concerned with learning of a type where the task involves material of personal significance to the student. It is material, therefore, where the presence of a live teacher or counselor has been regarded as especially important. The application of teaching machine procedures to these individual counseling sessions has followed the pattern of work by Crowder (1959) and Pressey (1960) rather than that of Skinner (1959). The branching type of program advocated by Crowder makes possible the individualizing of the program so that the student can select a set of materials to read which may be appropriate to him and perhaps not to any other student. Rather large sections of material, as advocated by Pressey, rather than small steps as advocated by Skinner were used in the writing of the Self-Counseling Manual. In the individual counseling situation the student's willingness to accept the information he receives is as important as his ability to understand it, and fairly long sections of material are often quite appropriate for this purpose.

The topics listed below are covered in the Self-Counseling Manual and are those topics which Student Counseling Service counselors agreed were typically covered in the type of pre-college counseling interview for which the Self-Counseling Manual was written.

I. Your test results and scholastic achievement.
II. Areas of specialization within the University.
III. Summary of interpretation of your test results.
IV. Study habits and reading.
V. Information about the University.
VI. Your personality characteristics and success.
VII. Areas of interest.

4. Subjects

The subjects used in the study were 391 males selected from high school seniors who had taken a battery of admissions, guidance, and placement tests and who came to the University of Illinois during the spring or summer for counseling preliminary to their entrance into the University in the fall.

Students were asked to participate in the research before they arrived on campus for their interview. Relatively few students declined to participate, and many of these declined because they were unable to arrive on campus in time for the pre-counseling questionnaire. Data is available to compare these non-participating students with participants.

5. Data Available for Analysis in the Project

a. The Pre-counseling Questionnaire. Immediately preceding the counseling interview each student filled out this questionnaire which included a section on college major and vocational plans, a section on estimates regarding his academic situation the first semester in college, a section on estimated abilities and interests as compared with other entering freshman at Illinois and a section called Expected Problem Areas in which the student checks items where he needs information or feels he has a problem.

b. The Post-counseling Questionnaire. Following the counseling interview the student filled out the Post-counseling Questionnaire which was the same as the Pre-counseling Questionnaire with two exceptions. Several items were added on which the student indicated his reaction to the counseling interview or the Counseling Manual if he had read this instead of seeing a counselor. Also the student indicated which items on the Expected Problem Areas were covered in the interview or Self-Counseling Manual and how helpful the interview was for these items that were covered.

c. Post-counseling Interviews. The student could return to see his counselor where the interview was Simulated Programmed Counseling or could see a counselor following his participation in Programmed Counseling.

In 29 out of 104 cases (28%) students who had read the Self-Counseling Manual asked to see a counselor and in 27 out of 95 cases (28%) students who had undergone Simulated Programmed Counseling asked to again see their counselor. These post-counseling interviews were also tape-recorded. In most cases the questions which the students had were of a minor nature and could be dealt with in a few minutes. In a few cases the problems brought up were quite serious and required considerable time in the post-counseling interview.

d. Materials Sent Home with the Student. It was clear from the tryout of the Self-Counseling Manual before its use in research, that one hour was frequently not long enough for the student to cover the material in which he might be interested. Consequently it was decided to send the Self-Counseling Manual to the students at home following Programmed Counseling and Simulated Programmed Counseling if the student requested to have it sent home. In the case of Simulated Programmed Counseling 82 of 95 students (86%) requested that the book be sent home and in the case of Programmed Counseling 89 of 104 students (86%) requested that the book be sent home. Other materials such as University bulletins, a pamphlet on how to study, and a study schedule were also given to the student following Normal-2 Counseling, Programmed Counseling, and Simulated Programmed Counseling, if he requested them.

e. The End-of-Semester Questionnaire. Two weeks before the end of their first semester in college the subjects were sent a questionnaire in which they stated their college major and vocational plans, and again estimated their abilities and interests as compared with University of Illinois freshman. They also rated the severity of their problems during the first semester for each item on the Expected Problem Areas list and answered a few questions about how satisfied they were with their first semester college experience. Scholastic achievement at the end of the first semester was available for each student.

f. The Counselor Prediction Form. The counselor, immediately following the research interview, filled out the Counselor Prediction Form in which he estimated how well the student was likely to do in school, how well satisfied he would be his first semester in college, how appropriate his curricular choice was, whether he had emotional or personal problems which will interfere with his satisfaction and achievement in college, and how valuable the interview was to the student.

g. Analysis of the Counseling Interviews. Judgment of the tape-recorded interviews were also used in the study.

6. Diagram of data collected.

The general schema below indicates the number of students seen by each counselor under each of the four conditions of counseling.

Counseling Condition	Counselor 1	Counselor 2	Counselor 3	Counselor 4	Total for each Counseling Condition.
Normal-1 Counseling	24	24	23	25	95
Normal-2 Counseling	26	25	21	26	98
Simulated Programmed Counseling	25	24	20	25	94
Programmed Counseling	--	--	--	--	104
Total for each Counselor	75	73	64	76	

7. Hypotheses to be tested. The design of the research project allowed the following comparisons.

a. Programmed Counseling compared with Simulated Programmed Counseling.

The personal relationship factor is present in Simulated Programmed Counseling and absent in Programmed Counseling. The importance of the personal relationship factor is being examined in this comparison. The criteria of particular interest in this comparison are effectiveness of learning and student evaluation of counseling. While comparisons are made in terms of flexibility, it is not expected that one procedure will be more flexible than another since

Simulated Programmed counseling was designed so that the counselor would follow the same order and content as does Programmed counseling. It is hypothesized that learning by the student will be as adequate and student evaluation will be as favorable under Programmed counseling as under Simulated Programmed Counseling.

b. Simulated Programmed Counseling compared with Normal-1 Counseling and Normal-2 Counseling.

Standardized interview which occur with Simulated Programmed Counseling were compared with the non-standardized interviews of Normal-1 and Normal-2 counseling. The personal relationship factor was present in both situations. The effect of the standardization which is imposed by the Programmed Counseling Manual is being tested. It is hypothesized that learning by the student will be as adequate and student evaluation will be as favorable under Simulated Programmed Counseling as under Normal-1 and Normal-2 Counseling. It is also predicted that Simulated Programmed Counseling will be as flexible as Normal-1 and Normal-2 Counseling.

c. Programmed Counseling compared with Normal-1 and Normal-2 Counseling.

The impersonal and standardized Programmed Counseling procedure is compared with the personal and non-standardized counseling procedure under conditions of Normal-1 and Normal-2 counseling. Since this comparison involves both of these factors combined, the implications of differences found may not be clear. It is, however, of practical interest to see how these two different procedures do compare. Can a Programmed Counseling Manual be substituted for a counseling interview and provide for the student the same or similar service? While it is apparent that certain functions cannot be served by the Programmed Counseling Manual that are served by the counselor, the hypothesis to be tested is that learning by the student will be as adequate and student evaluation will be as favorable under Programmed Counseling as under Normal-1 and Normal-2 Counseling, and that Programmed Counseling will be as flexible in dealing with the student's problems as will the counselors in Normal-1 and Normal-2 Counseling.

d. Normal-1 Counseling compared with Normal-2 Counseling.

In this comparison the effect of participation in the writing of the Programmed Counseling Manual is being studied. Since all four counselors in the project participated in this writing and in conferences where the nature of the Self-Counseling Manual was decided, it is quite possible that this process, which included having to define more clearly goals of this type of counseling interview, would have an effect on the counseling procedures followed. It should have a positive effect, so it is hypothesized that learning by the student will be more adequate and student evaluation will be more favorable under Normal-2 Counseling than under Normal-1 Counseling. Normal-2 Counseling is also predicted to be more flexible than Normal-1 Counseling.

II. Comparability of the Various Groups of Students in the Project

Four groups of students received counseling as a part of the research project and are referred to as students who received Normal-1 counseling, Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling. In addition, a group of non-participating students is made up of students who did not agree to participate in the research. Some of these students indicated that they did not wish to participate or could not participate and some students simply did not show up for the appointment. A control group was also obtained consisting of students who filled out the pre-counseling questionnaire at home and again from three to seven days later at the offices of the Student Counseling Service just prior to their counseling appointment. Finally, a Non-counseled group of students was selected consisting of students who filled out the end-of-semester questionnaire but who had not had an interview with a counselor on the Student Counseling Service staff prior to or during their first semester in college.

An effort was made to select students so as to make the counseled groups and the control group as similar as possible in regard to high school achievement and scholastic ability. All students in the study are males, so there are no sex differences to be concerned about. However, this may restrict generalization of the results of the study to college women in some respects.

Table 1 presents the percent of students in each quarter of their high school graduating class for all groups and also the mean high school rank for each group. The four counseled groups and the control group are so similar in high school rank that it is very unlikely that past scholastic achievement is an important factor to be considered in interpreting the research findings. The

Table 1. Percentage of Students in Each Quarter of Their High School Class for All Groups.

Counseling condition	N	Percentage of students in each quarter of HS class				
		Lowest Quarter %	3rd Quarter %	2nd Quarter %	Highest Quarter %	Mean. %
Normal-1 Counseling	96	3	8	22	67	78
Normal-2 Counseling	96	2	5	31	61	74
Programmed Counseling	104	2	9	25	64	74
Simulated Programmed Counseling	84	0	9	28	64	75
Non-participating students	36	3	11	25	61	73
Control Group	97	2	5	23	70	78
Non-Counseled Group	121	2	11	37	51	72

non-counseled group is slightly inferior in high school achievement.

The mean decile scores on the School and College Ability Test for each of the groups is presented in Table 2. Here, also, the differences in general aptitude for college are very small among the counseled groups. Non-participating and non-counseled students tend to average lower but not significantly so, while the control group is somewhat higher than the counseled groups. Correlations were computed between this score representing general aptitude for college and a number of the variables used as criteria in the study. Student reactions to counseling and ratings of help received in various problem areas (summarized in Section IV) are only slightly correlated with this score. These correlations range between -.32 and +.24 and indicate that slight differences between the various counseled groups in general aptitude are inconsequential as far as these reactions to counseling are concerned. Where changes of student estimates are being evaluated as in Sections V, VI, and VII the pre-counseling score involved in each rating or estimate must be taken account of in evaluation of the changes. This is discussed in the reports of those studies.

Table 3 presents data on Kuder Preference Record Personal Interest scores for the seven groups of students. Non-participating students differ from several of the other groups in that they have a lower mean score for Dominance. Except for this, the groups are quite comparable. On a form which students fill out prior to counseling, there is an opportunity for students to check certain positive and negative traits as applying or not applying to them. The frequency of positive and negative traits checked is very similar for all groups of students. Also, the groups have been compared on mean pre-counseling ratings of the thirty-six problems listed in Table 7 and only 14 significant differences were obtained where 11 would

Table 2. Mean Decile Scores on School and College Ability Test for All Groups.

	N	Mean Decile on SCAT
Normal-1 Counseling	96	5.01
Normal-2 Counsaling	98	4.73
Programmed Counseling	104	4.90
Simulated Programmed Counseling	95	4.85
Non-participating Students	36	4.47
Control group	96	5.47
Non-counseled group	121	4.47

Table 3. Kuder Preference Record Personal Interest scores of Non-Participating Students and Students Participating in the Four Conditions of Counseling.

	The four conditions of counseling				Non-participants	Control	Non-counseled
	Normal 1 Mean (N=96)	Normal 2 Mean (N=98)	Programmed Mean (N=103)	Simulated Mean (N=95)	Mean (N=36)	Mean (N=96)	Mean (N=120)
1. Preference for Group Activity	4.39	4.77	4.06	4.48	4.17	4.75	4.60
2. Preference for Stable Situation	4.80	4.43	4.60	4.72	4.50	4.88	4.70
3. Preference for Ideational Activities	6.49	7.03	6.33	6.33	5.69[1]	4.81	6.01
4. Preference for Conflict Avoidance	5.75	5.45	5.29	5.53	5.31	4.88	5.41
5. Preference for Dominance	5.94	5.60	5.11	5.19	4.08[2]	5.14	4.99

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[1] Difference from students in Normal-2 condition p less than .02

[2] Difference from students in Counseling as follows. Compared with Normal-1 and Normal-2 students p is less than .01. Compared with Simulated Programmed Group p is less than .05. Compared with Programmed Counseling Group p is less than .10.

be expected by chance. It is unlikely that the different groups vary significantly in regard to problems or personal characteristics. The control group is likewise comparable in these pre-counseling ratings.

The different counseled groups and the control groups appear in these general ways to be sufficiently similar so that differences obtained in the research project cannot be ascribed to gross differences between groups. The similarity of non-participating students in most respects to participating students suggests that results of the research project should apply to students in general who make application for a pre-college interview in a university such as Illinois.

The non-counseled students are included in the study so as to compare counseled and non-counseled students at the end of their first semester in college in regard to estimates of ability and interest.

III. Client Evaluations of Counseling

Client evaluations of counseling provide significant information about counseling in several respects. Within certain limitations they provide information about the effectiveness of counseling. While client evaluations are not sufficient data for this purpose, other data useful in assessing counseling is not sufficient without client evaluation. Client evaluations can also give information about which goals of counseling were achieved and which were not. And, since a certain degree of client acceptance of counseling procedures is necessary if counseling is to occur at all or be effective, the degree of client acceptance is important as a necessary condition for successful counseling even if it has limited usefulness as a basis for evaluation of counseling.

By means of the comparisons made in this study it is possible to describe student reactions under different counseling conditions so as to assess differences which may be ascribed to the personal relationship factor in counseling, the standardization of an interview, and a counselor training experience.

Student reactions to counseling have been investigated in a number of studies. General reactions of students to a single counseling interview or to several interviews are generally quite favorable. Kerr (1962) found 50% of students reporting that an interview with a high school counselor regarding choice of college was quite helpful or extremely helpful and only 12% felt that it was not helpful. Grigg (1961) reports 85% of clients felt that the two or more counseling interviews they received were helpful. Young (1955), Form (1953), Kiell (1957) and others have reported clearly favorable reactions to counseling counselors, and counseling agencies. These studies and a previous study in the Student Counseling Service regarding reactions of students to a pre-college counseling interview indicate that generally favorable reactions of students to this type of interview may be expected.

Little attention has been paid to careful assessment of student reactions to the various teaching machine procedures used in the many studies of programmed instruction. However, Skinner and Holland (1960) administered a questionnaire to students using teaching machines as an aid to a general course in psychology. Sixty-two per cent reported the machines made the text much easier to understand and ninety-nine per cent that it was of some help. Seventy-eight per cent felt they got more out of the course because of the use of the machines. If they were to take another similar course, sixty-seven would prefer to have such teaching machines used. In regard to negative reactions, fourteen per cent felt they were "being treated like an experimental organism" and five per cent felt that the machine reflected on their dignity as human beings.

Procedure

The assessment of student reactions to the four counseling conditions is based on two sets of items on the post-counseling questionnaire which immediately follows the counseling interview. In addition, two items on the questionnaire administered during the last two weeks of the first semester and certain informal data having to do with student responses to the interview will be discussed.

Results

Informal comments were obtained from students following the counseling received at the time of the interview following Programmed and Simulated Programmed counseling. Occasional dissatisfaction in regard to reading a book instead of seeing a counselor was expressed by a few students. When they were invited to do so, twenty-eight per cent of the students asked to see a counselor following their Programmed counseling. These tape recordings were listened to by judges who categorized questions which students asked. Agreement between judges was very high and these categories of questions indicate topics not adequately covered during the counseling interviews. The most frequently mentioned topic was concern over the implication of test scores. A significantly higher proportion of students (70%) indicated such concern under Programmed counseling than the proportion (36%) under Simulated Programmed counseling. Six students made negative comments about Programmed counseling and no students did so regarding Simulated Programmed counseling. These informal reactions lend support to the thesis that the personal relationship factor is important in counseling.

During the fall semester, those students in the research project who returned to the Student Counseling Service for counseling appointments were asked to comment on their summer counseling interview. Based on judges' ratings, the mean favorableness ratings of students taking part in Normal-2 counseling is greater than students who took part in Programmed or Simulated Programmed counseling. This difference is statistically significant ($p = .05$) only if students in the Normal-2 group are compared with the other two groups combined.[1] These data are not available for students in the Normal-1 group.

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[1] There may be bias in favor of Normal-2 counseling since students seen under this condition made their comments to the same counselor who had conducted the pre-counseling interview and this was not the case for Programmed counseling.

During the last two weeks of the first semester in college the students in the research project filled out a questionnaire in which two items dealt with their reaction to the pre-college interviews. One item asked how satisfied they were with the interview and there were no significant differences between groups in these ratings. A second item asked the student to indicate what things the counselor should have emphasized more than he did. Normal-1 students, who had been seen prior to the writing of the Self-Counseling Manual, listed more topics as not adequately covered than did Normal-2 students (p = .05). The results suggest that the experience in writing the Self-Counseling Manual may have benefited the counselors in regard to adequately covering these topics of importance to students. There were no other significant differences between conditions of counseling for this item.

While the informal and follow-up data do not show any very definite preference on the part of the students, results from the questionnaire immediately following the interview do show significant differences.

These data are presented in several tables as follows: Table 4 contains the means of student ratings of eight aspects of the counseling interview for each counseling condition. Each of the eight items was rated by the student on a five-point scale immediately following the interview. Table 5 lists the differences between means when each condition is compared with the other conditions. Table 6 summarizes the per cent of students making the most favorable ratings for each item and also the per cent of students making the least favorable ratings.

Table 7 presents the means of student ratings of the degree to which the interview was helpful in regard to each of thirty-six problem areas. These are also ratings on a five-point scale and the problems are grouped

Table 4. Student reactions to the counseling interview under the four conditions of counseling.

Items rated by the student	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling
	Mean	Mean	Mean	Mean
1. Were the explanations of test scores clear?	4.51	4.56	4.36	4.27
2. Did the counselor seem interested in trying to help you?	4.65	4.64	4.33	4.36
3. Was information helpful in educational and vocational planning?	3.85	4.20	3.45	3.51
4. Did you feel generally at ease during the interview?	4.01	4.12	4.03	4.17
5. If you have difficulties later, will you return for help?	4.52	4.55	3.98	4.05
6. Are you satisfied that this interview was a worthwhile experience?	4.44	4.55	3.98	4.05
7. Was information received about University helpful?	3.88	4.11	3.70	3.89
8. In your interview you should have learned some things about how and why you behave as you do which you did not know as clearly previously. How helpful do you feel this clearer knowledge will be to you in life generally?	3.50	3.81	3.45	3.53

Table 5 Differences in Student Reactions to the Counseling Interview Under Four Conditions of Counseling

Items rated by the student	N2-N1	Sm-Pg	N1-Pg	N2-Pg	N1-Sm	N2-Sm
1. Were the explanations of test scores clear?	.06	-.09	.15	.20*	.24*	.29**
2. Did the counselor or authors of the book seem interested in trying to help?	-.01	.03	.32**	.31**	.29**	.28**
3. Was information helpful in educational and vocational planning?	.35**	.06	.40**	.75**	.34*	.59**
4. Did you feel generally at ease during the interview?	.11	.14	-.02	.09	-.15	-.05
5. If you have difficulties later, will you return to the Student Counseling Service for help?	-.07	.07	.26	.19	.19	.12
6. Are you satisfied that this interview was a worth-while experience?	.13	.07	.56**	.57**	.37**	.50**
7. Was information received about University helpful?	.23*	.19	-.18	.41**	-.01	.22
8. In your interview you should have learned some things about how and why you behave as you do which you did not know as clearly previously. How helpful do you feel this clearer knowledge will be to you in life generally?	.31*	.08	-.05	.36**	-.03	.28

*p = .05
**p = .01

(N1 = Normal-1 Counseling; N2 = Normal-2 Counseling; Pg = Programmed Counseling; Sm = Simulated Programmed Counseling.)

Table 6 Student Reactions to the Counseling Interview which are in the Extreme Categories

Ratings made	Normal-1 Counseling (N = 96)	Normal-2 Counseling (N = 97)	Programmed Counseling (N = 104)	Simulated Programmed Counseling (N = 95)
1. Were explanations of test scores clear?				
Very clear	57	64	43	44
Not clear at all	1	0	0	0
2. Did the counselor (or authors of book) seem interested in trying to help?				
Very interested	66	65	50	49
Not interested	0	0	1	0
3. Was the information helpful in educational and vocational planning?				
Very helpful	31	37	13	18
Not helpful	2	0	2	4
4. Did you feel generally at ease during the hour?				
Very much at ease	32	37	35	33
Not at ease at all	1	0	3	0
5. If you have difficulties, will you return to the Counseling Service for help?				
Definitely will return	61	56	46	50
Definitely will not return	0	0	0	1
6. All in all are you satisfied that the interview was a worthwhile experience?				
Very satisfied	55	60	33	35
Not satisfied	0	0	1	3
7. Was the information you received regarding the University useful?				
Very useful	23	30	16	23
Not useful	1	0	1	2
8. In your interview you should have learned some things about how and why you behave as you do which you did not know as clearly previously. How helpful do you feel this clearer knowledge will be to you in life generally?				
Very helpful	15	16	10	13
Not helpful	3	2	0	3

Table 7 Mean ratings of degree of help received for problem areas covered under the four conditions of counseling.

Problem Area	Mean rating of degree of help received							
	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	N	Mn	N	Mn	N	Mn	N	Mn
1. Aptitude and preparation for college.								
Knowledge of scholastic aptitudes	(96)	3.53	(95)	3.85	(103)	3.29	(95)	3.26
Knowing adequacy of preparation for college.	(70)	3.46	(84)	3.67	(93)	3.18	(71)	3.13
2. Scholastic problems								
Knowing courses to be taken first semester	(57)	3.16	(73)	3.56	(29)	2.55	(28)	2.57
Scholastic requirements at the University	(36)	2.83	(47)	3.19	(65)	2.97	(70)	3.01
Level of difficulty of courses	(58)	3.14	(55)	3.24	(65)	2.86	(66)	3.15
Information about college curricula	(57)	3.09	(72)	3.38	(50)	2.86	(58)	2.84
3. Vocational problems								
Knowing interests as related to vocational choice	(93)	3.68	(95)	3.87	(103)	3.23	(90)	3.64
Information about occupations	(65)	3.17	(65)	3.25	(72)	2.99	(54)	2.98
Uncertainty about vocational choice	(74)	3.50	(77)	3.64	(89)	2.94	(80)	3.20
Selection of a college major	(77)	3.26	(81)	3.52	(97)	2.93	(79)	3.15
4. Motivational problems								
Problems with scholastic motivation	(45)	3.44	(50)	3.46	(85)	3.00	(83)	3.16
Lack of energy and ambition	(22)	3.18	(23)	3.13	(64)	2.41	(40)	2.55
Too easily discouraged	(10)	3.60	(10)	2.70	(43)	2.35	(20)	2.40
Not taking things seriously enough	(13)	3.08	(27)	2.78	(63)	2.40	(35)	2.60
5. Not achieving scholastically as well as I should	(64)	3.27	(72)	3.54	(94)	3.23	(76)	3.29

	Mean rating of degree of help received							
	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	N	Mn	N	Mn	N	Mn	N	Mn
6. Work Efficiency								
Efficiency and organization in my work	(30)	3.30	(55)	3.49	(91)	3.16	(88)	3.48
Industriousness, hard work, and persistence	(43)	3.07	(54)	3.43	(77)	3.00	(62)	3.23
Self discipline and avoiding procrastination	(34)	3.18	(50)	3.66	(84)	2.98	(71)	3.24
7. Personal adjustment								
Feeling of inadequacy in social relations	(14)	2.43	(16)	2.63	(69)	2.20	(34)	2.50
Either too much or too little social life	(17)	2.53	(34)	2.82	(66)	2.32	(48)	2.58
Personal adjustment and self confidence	(35)	3.00	(39)	3.26	(77)	2.55	(53)	2.91
Worrying, fears, anxiety	(20)	3.10	(26)	2.96	(57)	2.26	(28)	2.82
Being mature and accepting responsibility	(16)	2.94	(28)	3.18	(65)	2.49	(59)	2.88
Feelings of inferiority	(6)	3.17	(10)	2.80	(54)	2.20	(18)	2.22
8. Problems of relationships with parents.	(25)	2.84	(24)	2.13	(63)	1.86	(35)	2.37
9. Miscellaneous								
Information about honors programs	(24)	3.13	(16)	3.00	(18)	1.83	(10)	2.10
Information about housing	(38)	2.26	(44)	2.48	(16)	2.19	(15)	2.33
Information about rules and regulations	(3)	3.00	(8)	2.38	(22)	2.55	(20)	2.25
Military requirements and opportunities	(21)	2.62	(37)	2.51	(8)	1.88	(5)	2.40
Extra-curricular activities	(31)	2.74	(39)	2.64	(34)	2.38	(22)	2.77
Athletics information	(14)	2.47	(20)	2.60	(9)	2.33	(1)	2.00
Financial problems	(30)	2.73	(31)	2.58	(16)	2.00	(6)	2.67
Health problems	(14)	2.93	(9)	2.00	(18)	2.39	(22)	2.68
Religious problems	(2)	2.00	(4)	2.50	(54)	2.15	(22)	2.64
Relations with faculty and administration	(36)	3.19	(35)	3.29	(60)	2.77	(61)	3.10
Concern about large size of University	(26)	3.31	(29)	2.59	(29)	2.72	(34)	2.94

on the basis of a cluster analysis performed according to a method developed by McQuitty (1957). Table 8 presents the differences between means when each condition is compared with other conditions.

In order to evaluate the effects which differences between counselors may have on the results, Table 9 presents means of ratings for each counselor for each condition of counseling on the eight items having to do with the different aspects of the counseling interview. Table 10 presents the results of an analysis of variance involving counselor and method for certain of these items.

These data will be discussed in terms of the four comparisons of the different conditions of counseling outlined previously.

1. Programmed counseling as compared with Simulated Programmed counseling.

As indicated in Tables 4 and 5, none of the differences in mean ratings are statistically significant and the differences are very small. Also no significant differences in percentage of extreme ratings occur in Table 6. As far as these ratings are concerned, it cannot be said that the presence of the personal relationship factor in Simulated Programmed counseling results in any more favorable reactions to the interview than is the case with Programmed counseling.

Table 7 compares these two counseling conditions in regard to the degree to which the interview was rated by students as helpful for each of 36 problem areas. Each rating is on a five-point scale ranging from one (little or no help) to five (extremely helpful) and the mean of the ratings for each item represents the mean of the ratings for those students who say that the problem area was covered in the interview. Consequently, the number

Table 8. Differences in mean ratings of degree of help received for various problem areas. (Ratings based on five point scale.)

Problem Areas	Differences in mean ratings (1)					
	N2-N1	Sm-Pg	N1-Pg	N2-Pg	N1-Sm	N2-Sm
1. Aptitude and preparation for college						
Knowledge of scholastic aptitudes	.32*	-.03	.24	.56*	.27	.59**
Knowing adequacy of preparation for college	.21	-.05	.28	.49**	.33*	.54**
2. Scholastic problems						
Knowing courses to be taken first semester	.40*	.02	.61*	1.01**	.59*	.99**
Scholastic requirements at the University	.36	.04	-.14	.22	-.18	.18
Level of difficulty of courses at University	.10	.29	.28	.38	-.01	.09
Information about college curricula	.29	-.02	.23	.52**	.25	.54**
3. Vocational problems						
Knowing interests as related to vocational choice	.19	.41**	.45**	.64**	.04	.23
Information about occupations	.08	-.01	.18	.26	.19	.27
Uncertainty about vocational choice	.14	.26	.56**	.70**	.30	.44**
Selection of college major	.26	.22	.33	.59	.11	.37
4. Motivational problems						
Problems with scholastic motivation	.02	.16	.44	.46	.28	.30
Lack of energy or ambition	-.05	.14	.77**	.72*	.63*	.58*
Too easily discouraged	-.90*	.05	1.25**	.35	1.20*	.30
Not taking things seriously enough	-.30	.20	.68	.38	.48	.18
5. Not achieving scholastically as well as I should	.27	.06	.04	.31	-.02	.25
6. Work efficiency						
Efficiency and organization in my work	.19	.32*	.14	.33	-.18	.01
Industriousness, hard work and persistence	.36	.23	.07	.43*	-.16	.20
Self-discipline and avoiding procrastination	.48*	.26	.20	.68**	-.06	.42**

	N2-N1	Sm-Pg	N1-Pg	N2-Pg	N1-Sm	N2-Sm
7. Personal Adjustment						
Feeling of inadequacy in social relations	.20	.30	.23	.43	-.07	.13
Either too much or too little social life	.29	.26	.21	.50*	-.05	.24
Personal adjustment and self-confidence	.36	.36	.45*	.71**	.09	.35
Worrying, fears, anxiety	-.14	.56*	.84**	.70**	.28	.14
Being mature and accepting responsibility	.24	.39*	.45	.69**	.06	.30
Feelings of inferiority		.02		.60		.58
8. Problems of relationship with parents	-.71	.51*	.98**	.27	.47	-.24
9. Miscellaneous problems						
Information about honors programs	-.13	.27	1.30**	1.17**	1.03*	.90
Information about housing	.22	.14	.07	.29	-.07	.15
Information about University rules and regulations		-.30				
Military requirements and opportunities	.11					
Extra-curricula activities	-.10	.39	.36	.26	-.03	-.13
Athletics information	.13					
Financial problems	.15	.67	.73	.58	.06	-.09
Health problems		.29	.54		.25	
Religious problems		.49				
Relations with faculty and administration	.10	.33	.42	.52	.09	.19
Concern about large size of University	-.72*	.22	.59	-.13	.37	-.35

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*p = .05, two tailed test

**p = .01, two tailed test

(1)N1 = Normal-1 counseling; N2 = Normal-2 counseling; Pg = Programmed counseling; Sm = Simulated Programmed counseling. No figures are listed in table where N is less than 10 for one of counseling conditions being compared.

Table 9. Student Reactions to Counseling for Each Counselor for Each Condition of Counseling.*

Groups counseled by each counselor for each condition	Clearness of test interpretations	Counselor interested in trying to help	Information helpful in Educ., Voc. Plans	At ease during interview	If difficulties will return to SCS	All in all a worth-while experience	Information about university helpful	Clearer self-knowledge help in life generally	Mean of all eight scales
	Mean reaction on a 5 point scale 5 is highest rating, 1 is lowest rating								
Normal 1 Counseling									
Counselor 1	4.3	4.5	3.9	4.1	4.6	4.5	3.8	3.6	4.1
Counselor 2	4.5	4.5	3.5	4.2	4.4	4.1	3.8	3.1	4.0
Counselor 3	4.7	4.7	4.0	3.9	4.6	4.4	4.0	3.5	4.2
Counselor 4	4.6	4.8	4.0	3.8	4.5	4.6	4.0	3.8	4.1
All counselors	4.5	4.7	3.8	4.0	4.5	4.4	3.9	3.5	4.2
Normal 2 Counseling									
Counselor 1	4.5	4.7	4.3	4.4	4.8	4.5	4.2	3.7	4.4
Counselor 2	4.6	4.6	4.2	4.2	4.4	4.5	4.0	3.4	4.3
Counselor 3	4.6	4.5	4.1	4.0	4.1	4.5	4.0	4.0	4.2
Counselor 4	4.5	4.7	4.2	3.8	4.4	4.7	4.2	4.2	4.3
All Counselors	4.5	4.6	4.3	4.1	4.4	4.6	4.1	3.8	4.3
Simulated Book Counseling									
Counselor 1	4.4	4.7	3.7	4.2	4.4	4.3	4.1	3.8	3.9
Counselor 2	4.0	4.0	3.4	4.0	4.4	3.9	3.7	3.6	3.9
Counselor 3	4.3	4.2	3.4	4.3	3.9	3.6	3.8	3.1	3.8
Counselor 4	4.4	4.5	3.6	4.2	4.6	4.3	4.0	3.6	4.2
All Counselors	4.2	4.3	3.5	4.2	4.0	4.0	3.9	3.5	4.0
Programmed Counseling	4.4	4.3	3.4	4.0	4.3	4.0	3.7	3.4	4.0

*A difference of .4 or greater between mean ratings of a group seen by one counselor under one condition and another counselor under that condition is usually significant at the .05 level.

Table 10. Student Reactions to Counseling. Analysis of Variance Significance Values for Counselor Differences and Differences in Counseling Condition.

Item rated	Counseling Condition Differences	Counselor Differences	Interaction
1. Were the explanations of test scores clear?	.001		
2. Did the counselor seem interested in trying to help?	.005	.01	
3. Was the information helpful in educational and vocational planning?	.001		
4. If you have difficulties later, will you return to the Student Counseling Service for help?		.001	
5. Are you satisfied that this interview was a worthwhile experience?	.001		
6. In your interview you should have learned some things about how and why you behave as you do which you did not know as clearly previously. How helpful do you feel this clearer knowledge will be to you in life generally?	.05		.005

of students making these ratings varies from item to item, and from one counseling condition to another. There are significant differences in regard to the frequency with which certain problem areas are covered under the two conditions even though the order and content of the counseling under these two conditions are supposed to be identical.

As indicated in Table 8, five items receive significantly higher ratings ($p = .05$) for Simulated Programmed counseling than for Programmed counseling. These differences occur on items which are important problem areas with which counseling presumably can be of help and suggest that the personal relationship factor is important in counseling in regard to student estimate of help received with certain problems.

2. Simulated Programmed counseling compared with Normal-1 and Normal-2 counseling.

General student reactions to counseling immediately following the interview are summarized in Tables 4 and 5, and indicate that in regard to four of the eight items both Normal-1 and Normal-2 counseling are preferred by the students over Simulated Programmed counseling. In no case is Simulated Programmed counseling preferred to a significant degree. The statistically significant differences which are found have to do with important aspects of counseling such as the clarity of the explanation of test scores, the counselor's interest in trying to help the student, whether or not information given was helpful in educational and vocational planning, and general satisfaction with the interview. As indicated in Table 6, the percentage of very favorable reactions to the interview is also greater for normal counseling.

In Tables 7 and 8 the rated degree of help received in the interview in regard to the various problem areas is likewise greater for normal counseling.

The significant differences which are found all favor normal counseling. It is clear that students believe they receive more help from normal counseling in regard to a number of important problems.

3. Programmed counseling compared with Normal counseling.

Student reactions to counseling summarized in Tables 4 and 5 indicate that students generally prefer Normal-1 and Normal-2 counseling to Programmed counseling. Normal-1 counseling was preferred in regard to four items and Normal-2 counseling preferred in regard to six items. In no case was Programmed counseling preferred over normal counseling. A higher proportion of very favorable reactions to the interview occur for Normal counseling.

Tables 7 and 8 summarize the rated degree of help received for each of the 36 problem areas for students undergoing Programmed counseling and Normal counseling. In regard to these problems also all of the significant differences favor normal counseling and in 22 items either Normal-1 or Normal-2 counseling is rated as more helpful than Programmed counseling. In no case was Programmed counseling significantly superior.

4. *Normal-1 counseling compared with Normal-2* counseling.

The comparison of Normal-1 and Normal-2 counseling is made so as to determine whether or not the counselor's training experience involved in the joint writing of the Self-Counseling Manual would have a beneficial effect on counseling. Normal-2 counseling followed this experience and Normal-1 counseling preceded it.

Tables 4 and 5 summarize general student reactions to the counseling interview immediately following the interview and in three instances Normal-2 counseling was reacted to more favorably than Normal-1 counseling and to a statistically significant degree. In no instance was the preference for Normal-1 counseling large or statistically significant.

The degree to which the counselor was rated as helpful in regard to the various problem areas covered under the two conditions is indicated in Tables 7 and 8. Each of the conditions is favored over the other to a statistically significant degree for three items.

It should be noted that students seen under Normal-1 counseling received generally more favorable predictions of scholastic success based on test interpretations as a result of the fact that the test norms for the general aptitude test used in the project were too low. This may account for some of the differences in student reactions to Normal-1 counseling as compared with the other three counseling conditions.

5. Differences between counselors in reactions to the counseling interview

While the same four counselors were involved in counseling under the three conditions where a counselor was present, it is possible that interaction effects involving counselor and condition of counseling may be important. Consequently, in Table 9, mean reactions to counseling are presented for each counselor for each condition of counseling. It will be seen that there are significant differences between counselors in some instances. Table 10 presents the results of an analysis of variance for certain items in order to determine any interaction effects.

The analysis of variance was performed for six of the eight items having to do with reactions to the counseling interview and for the three counseling conditions where a counselor was present. The results indicate that significant differences between conditions occur except for the question of returning to the

Counseling Service for further help. In each case, Normal-2 counseling is rated significantly higher than Simulated Counseling. Differences between counselors are significant for two items having to do with how interested the counselor was in trying to help the student and whether the student would return to the Counseling Service for help. Significant interaction occurs only with an item having to do with degree of general and significant help received by the student. In this case, one counselor was rated more helpful under the Simulated Programmed counseling condition than under the normal counseling conditions. For the other three counselors the reverse was true.

While significant counselor differences are found for two items and interaction of counselor and condition for another item, these findings do not suggest that counselor differences should limit the general findings in regard to differences between the counseling conditions studied.

Summary and Discussion

From the comparison of the four conditions of counseling under study, the results indicate that student evaluations of the counseling and of help received do differ significantly among the four conditions. The clearest difference suggests that the standardization of the interview which is present in both the Programmed and Simulated Programmed counseling conditions is reacted to less favorably by students than the Normal conditions where there was no standardization. The clear preference by students for the Normal-1 and Normal-2 conditions over both Programmed and Simulated Programmed conditions suggests that students are reacting negatively to the standardization of the interviews.

The importance of the personal relationship factor is less easy to evaluate since the more general reactions to the counseling interview as reported in Table 1 are as favorable for Programmed as for Simulated Programmed counseling. Some evidence favoring the Simulated Programmed condition in which the personal relationship factor is present is found in regard to help received in certain problem areas. Significant differences do result favoring the presence of the personal relationship. These occur for five items and are suggestive of the importance of the personal relationship factor.

The largest differences occur when Programmed counseling (impersonal and standardized) is compared with Normal counseling (personal and non-standardized). There is no question about student preferences for Normal counseling over Programmed counseling.

The importance of counselor experience in the writing of the Self-Counseling Manual as evidenced by the superiority of Normal-2 counseling over Normal-1 counseling is not entirely clear. However, the nature of the items on which more favorable reactions to Normal-2 counseling are made suggest that the writing of the Self-Counseling Manual was a significant training experience. The differences which favor Normal-2 counseling tend to be those which are emphasized in the Self-Counseling Manual or were emphasized during the writing of the Self-Counseling Manual.

In addition to the above comparisons of different counseling conditions, the general level of acceptance of the counseling conditions being studied is of interest. If Programmed counseling is to be useful, students must accept it well enough to be willing to use it. The mean reactions of students in Tables 1 and 4 give us some information on this point. The mean reaction for all 8 items in Table 1 for the Programmed condition is 3.91 where 4.00 means a reaction of "quite helpful" etc. Also, in Table 3 the percent of very favorable reactions to Programmed counseling ranges from 13 to 50 and suggests that many students were very well

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training does appear to show up in somewhat more favorable reactions to the counseling received for students seen after the counselor training experience.

Favorableness of student reaction is great enough, however, even for the less favored procedures, so that the Programmed counseling and Simulated Programmed counseling are acceptable to students.

IV. Coverage and Flexibility in Counseling

Individual counseling is a procedure in which it is presumed that the counselor is responsive to the client's needs. The counselor should be of help or seek to be of help to the client in regard to those problems which the client presents or which the counselor perceives. Group counseling should also be responsive to the client's needs, but such responsiveness is limited by the nature of the group situation and superiority of individual counseling over group counseling in some instances may reflect this difference. Individual counseling might be considered the prototype of teaching which is responsive to individual needs of the learner. What the client learns in counseling should vary from client to client and should be related to the needs or problems of the individual client. Consequently, any evaluation of counseling should include an assessment of the flexibility of the counselor in responding to the client's needs. If the counseling procedure is flexible, those clients whose problems in a certain area are most severe should receive the greatest coverage and perhaps help from the counselor.

Counseling, as received by reading the Self-Counseling Manual, was designed to be as flexible as possible. By selecting a branching type of programming, it was expected that the procedure could be made as flexible or adaptive to the student's needs as would be the case in normal counseling. Because only an hour could be devoted to the Programmed Counseling procedure, the flexibility which could be built into the Self-Counseling Manual used in the project was severly limited. Because of time limitations and other practical considerations, certain sections of the Counseling Manual were made inflexible. Theoretically, it would be possible to make programmed counseling as flexible or more flexible than the individual counselor, if we may assume that the counselor is not completely flexible. But, in writing such a program, it takes some of the students time for each instance in which the flexibility is involved since he must read the directions which allow for flexibility. While other mechanical devices such as use of electronic equipment might overcome this time limitation, it seems likely that, if one is limited to programmed written materials, each branch takes some time and therefore the flexibility of the program is limited.

Even within the limitations of the branching possible in a one-hour period, it was considered possible that Programmed Counseling as conducted in the project could be as flexible and give as good coverage on the average as does the counselor. It was hypothesized, therefore, that Programmed Counseling would be as flexible as Normal counseling. Simulated Programmed Counseling in which the counselor follows the order and content of the Self-Ccunseling Manual as nearly as possible, involved an additional time limitation since it takes longer to speak words than to read them. This meant that coverage, if not flexibility, in Simulated Programmed Counseling might be less adequate than in either of the other two conditions.

A search of the literature does not reveal any studies where flexibility of the counselor has been studied, so the present study has interest as an indication of the degree to which the counselor is flexible in normal counseling as well as in Programmed counseling.

Indices of Coverage and Flexibility

The analysis of flexibility and coverage is based on student ratings before counseling of "concern or need for information" for each of thirty-six problems and ratings after counseling of whether or not the problem was covered in the interview. If the student indicates that the problem was covered in the counseling interview, he also rates the degree to which the interview was helpful with reference to that problem. The pre-counseling rating was made on a five point scale ranging from "No concern or need for information" to "Considerable concern or need for information". The ratings of help received after the interview ranged on a five point scale from "Little or no help" to "Extremely helpful".

A cluster analysis was performed based on the intercorrelations of the student ratings of their "concern or need for information" on the thirty-six problems. The clusters were obtained by the method described by McQuitty (1957), and the thirty-six problems are grouped into these clusters in Tables 11,12, and 13.

The reliability of the pre-counseling ratings of problems by students are listed in Table 11 in terms of a test-retest reliability coefficient based on the control group students.

The index of coverage is simply the percent of students who report that a problem was covered in their counseling interview. These percentages are listed in Table 12 as the figures in parentheses. These data indicated that there are differences in the degree to which the various problems were covered under the different conditions of counseling. For example, personal problems were covered under Programmed counseling with greater frequency than under the normal counseling conditions. However, the question of particular areas being covered is not of primary importance since one could write a programmed manual to cover whatever topics one wished or instruct a counselor to cover certain topics. It is important that the general coverage under the conditions of Programmed and

Table 11. Control Group Ratings of Expected Problem Areas

N = 97

	Mean		r Pre, Post
	Pre	Post	
Aptitude and preparation for college			
1. Knowledge of scholastic aptitudes	3.02	3.03	.738
2. Knowledge adequacy of preparation for college	3.11	2.98	.650
Scholastic problems			
4. Knowing courses to be taken first semester	3.62	3.53	.758
5. Scholastic requirements at the University	3.09	2.96	.484
6. Level of difficulty of courses at the University	3.56	3.29	.684
8. Information about college curricula	3.23	3.19	.576
Vocational problems			
7. Knowing interests as related to vocational choice	3.38	3.28	.692
9. Information about occupations	3.16	2.96	.656
21. Uncertainty about vocational choice	3.11	2.39	.844
22. Selection of a college major	3.05	3.04	.731
Motivational problems			
23. Problems with scholastic motivation	2.68	2.73	.555
31. Lack of energy and ambition	2.24	2.42	.587
32. Too easily discouraged	2.19	2.16	.634
33. Not taking things seriously enough	2.33	2.49	.766

	Mean		r Pre, Post
	Pre	Post	
Not achieving scholastically as well as I should (19)	3.38	3.23	.655
Work efficiency			
34. Efficiency and organization in my work	2.93	2.89	.640
35. Industriousness, hard work and persistence	2.65	2.66	.646
36. Self-discipline and avoiding procrastination	2.81	2.86	.704
Personal adjustment			
25. Feelings of inadequacy in social relations	2.32	2.27	.652
26. Either too much or too little social life	2.59	2.54	.674
27. Personal adjustment and self-confidence	2.65	2.54	.540
28. Worrying, fears, anxiety	2.49	2.38	.621
29. Being mature and accepting responsibility	2.38	2.40	.511
30. Feelings of inferiority	2.07	2.07	.747
Problems of relationship with parents (24)	2.08	2.00	.834

Miscellaneous	Mean Pre	Mean Post	r Pre, Post
3. Information about honors programs	3.08	2.90	.764
10. Information about housing	2.47	2.34	.814
11. Information about rules and regulations	3.01	2.77	.645
12. Military requirements and opportunities	2.94	2.79	.715
13. Extra-curricular activities	3.19	2.97	.567
14. Athletics information	2.73	2.64	.763
15. Financial problems	3.07	2.95	.730
16. Health problems	2.12	2.15	.774
17. Religious problems	2.14	2.08	.841
18. Problems with faculty and administration	2.88	2.68	.656
20. Concern about large size of University	2.42	2.40	.825

Table 12 Flexibility of Coverage Under the Four Conditions of Counseling.

Problem Areas	Correlation between student's pre-counseling, rating of seriousness of problem and student's statement of whether or not problem was covered in interview.							
	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	% Covered	r_{bis}	%Covered	r_{bis}	% Covered	r_{bis}	% Covered	r_{bis}
1. Aptitude and preparation for college								
Knowledge of scholastic aptitudes	(100)		(100)		(100)		(100)	
Knowledge adequacy of preparation for college	(73)	.06	(89)	.14	(90)	.04	(74)	.06
2. Scholastic problems								
Knowing courses to be taken first semester	(57)	-.12	(77)	.10	(28)	-.35*	(30)	-.07
Scholastic requirements at the University	(37)	.26*	(50)	.22*	(63)	-.13	(74)	.15
Level of difficulty of courses at University	(60)	.26*	(58)	.20*	(63)	-.07	(69)	.18
Information about college curricula	(59)	.14	(76)	.16	(48)	.03	(61)	.13
3. Vocational problems								
Knowing interests as related to vocational choice	(96)		(100)		(100)		(95)	
Information about occupations	(68)	.31*	(68)	.18	(70)	.25*	(57)	-.12
Uncertainty about vocational choice	(77)	.38*	(81)	.36*	(86)	.28*	(84)	.28*
Selection of a college major	(80)	.48*	(85)	.29*	(94)		(83)	.06
4. Motivational problems								
Problems with scholastic motivation	(47)	.29*	(53)	.50*	(82)	.38*	(87)	.23*
Lack of energy and ambition	(23)	.25*	(25)	.30*	(62)	.15	(42)	.15
Too easily discouraged	(10)	.12	(10)	.17	(42)	.03	(21)	.18
Not taking things seriously enough	(14)	.18	(29)	.04	(61)	-.04	(37)	.24*
5. Not achieving scholastically as well as I should	(67)	.15	(76)	.25*	(91)		(80)	.22*

Table 12 (continued)

	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	% Covered	r_{bis}	% Covered	r_{bis}	% Covered	r_{bis}	% Covered	r_{bis}
6. Work efficiency								
Efficiency and organization in in my work	(31)	.15	(58)	.18	(88)	.23*	(93)	
Industriousness, hard work and persistence	(45)	-.05	(57)	.25*	(75)	.10	(65)	.14
Self discipline and avoiding procrastination	(35)	.14	(53)	.24*	(81)	.27*	(75)	.24*
7. Personal adjustment								
Feeling of indaequacy in social relations	(15)	.23*	(17)	.10	(67)	.14	(36)	.19
Either too much or too little social life	(18)	.29*	(36)	.19	(64)	.37*	(31)	.16
Personal adjustment and self-confidence	(36)	.31*	(41)	.14	(75)	.31*	(56)	.28*
Worrying, fears, anxiety	(21)	.32*	(28)	.29*	(55)	.02	(30)	.12
Being mature and accepting responsibility	(17)	.24*	(30)	.02	(63)	.13	(62)	.08
Feelings of inferiority	(6)		(10)	.22*	(52)	.19	(19)	.25*
8. Problems of relationship with parents	(26)	.15	(26)	.06	(61)	.13	(37)	.10
9. Miscellaneous								
Information about honors programs	(26)	.25*	(17)	.17	(17)	.07	(10)	.20*
Information about housing	(40)	.27*	(46)	.17	(16)	-.04	(16)	.17
Information about rules and regulations	(3)		(8)		(21)	.08	(21)	.19
Military requirements and opportunities	(22)	.17	(39)	.12	(8)		(5)	
Extra-curricular activities	(32)	.21*	(41)	.05	(33)	.11	(23)	.20*
Athletics information	(16)	.21*	(21)	.39*	(9)		(1)	
Financial problems	(31)	.29*	(33)	.08	(16)	-.17	(6)	.07
Health problems	(15)	.18	(9)		(17)	-.24*	(23)	.32*
Religicus problems	(2)		(4)		(52)	.09	(23)	.00
Problems with faculty and administration	(37)	-.04	(37)	.07	(58)	.12	(64)	-.10
Concern about large size of University	(27)	-.12	(31)	.37*	(28)	.12	(36)	.18

Table 13. Correlations between severity of pre-counseling problem and student's rating of help received for four conditions of counseling.

Problem Areas	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	(N=96)		(N=98)		(N=104)		(N=96)	
	% Covered	r	% Covered	r	% Covered	r	% Covered	r
I. Aptitude and preparation for college								
1. Knowledge of scholastic aptitudes	(100)	.25*	(100)	.11	(100)	.23*	(100)	-.08
2. Knowledge adequacy of preparation for college	(73)	.07	(89)	.33*	(90)	.01	(74)	.05
II. Scholastic problems								
4. Knowing courses to be taken first semester	(59)	-.05	(77)	-.20*	(28)	-.29**	(30)	-.07
5. Scholastic requirements at the University	(37)	.21*	(50)	.25*	(63)	-.08	(74)	.12
6. Level of difficulty of courses at University	(60)	.24*	(58)	.23*	(63)	.02	(69)	.12
8. Information about college curricula	(59)	.10	(76)	.19	(48)	.01	(61)	-.01
III. Vocational Problems								
7. Knowing interests as related to vocational choice	(96)	-.02	(100)	-.05	(100)	.09	(95)	.11
9. Information about occupations	(68)	.22*	(68)	.22*	(70)	.26**	(57)	-.06
21. Uncertainty about vocational choice	(77)	.35**	(81)	.34**	(86)	.32**	(84)	.20
22. Selection of a college major	(80)	.36**	(85)	.22*	(94)	.16	(83)	-.05
IV. Motivational problems								
23. Problems with scholastic motivation	(47)	.26*	(53)	.31**	(82)	.26*	(87)	.28**
31. Lack of energy and ambition	(23)	.15	(25)	.26*	(62)	.21	(42)	.18
32. Too easily discouraged	(10)	.11	(10)	.11	(42)	.08	(21)	.09

Table 13. (Continued)

Problem Areas	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling	
	(N=96)		(N=98)		(N=104)		(N=95)	
	% Covered	r	%Covered	r	% Covered	r	% Covered	r
33. Not taking things seriously enough	(14)	.19	(29)	-.10	(61)	-.05	(37)	.23*
V. Not achieving scholastically as well as I should (19)	(67)	.23*	(76)	.26*	(91)	.08	(80)	.20
VI. Work efficiency								
34. Efficiency and organization in my work	(31)	.10	(58)	.20*	(88)	.07	(93)	.05
35. Industriousness, hard work, and persistence	(45)	.02	(57)	.16	(75)	.13	(65)	.05
36. Self-discipline and avoiding procrastination	(35)	.11	(53)	.17	(81)	.14	(75)	.10
VII. Personal adjustment								
25. Feeling of inadequacy in social relations	(15)	.22*	(17)	.10	(67)	.21	(36)	.14
26. Either too much or too little social life	(18)	.23*	(36)	.24*	(64)	.35**	(51)	.11
27. Personal adjustment and self-confidence	(34)	.22*	(41)	.10	(75)	.34**	(56)	.22
28. Worrying, fears, anxiety	(21)	.20	(28)	.15	(55)	.14	(30)	.09
29. Being mature and accepting responsibility	(17)	.12	(30)	-.00	(63)	.19	(62)	.19
30. Feelings of inferiority	(6)	.15	(10)	.08	(53)	.27	(73)	.11
VIII. Problems of relationship with parents (24)	(26)	.15	(26)	.08	(61)	.17	(37)	.12

Table 13. (Continued)

Problem Areas	Normal-1 Counseling (N=96)		Normal-2 Counseling (N=98)		Programmed Counseling (N=104)		Simulated Programmed Counseling (N=95)	
	% Covered	r	% Covered	r	% Covered	r	% Covered	r
IX. Miscellaneous								
3. Information about honors programs	(25)	.24*	(17)	.16	(17)	.03	(10)	-.04
10. Information about housing	(40)	.22*	(46)	.18	(16)	.02	(16)	.08
11. Information about rules and regulations	(3)	-.21	(8)	.10	(21)	.09	(21)	.08
12. Military requirements and opportunities	(22)	.04	(39)	.14	(8)	-.01	(5)	.07
13. Extra-curricular activities	(32)	.12	(41)	.01	(33)	.08	(23)	.11
14. Athletics information	(16)	.13	(21)	.22	(9)	-.07	(1)	.13
15. Financial problems	(31)	.23	(33)	.21	(16)	-.14	(6)	.06
16. Health problems	(15)	.11	(9)	.29**	(17)	-.17	(23)	.23
17. Religious problems	(2)	.22	(4)	.07	(52)	.05	(23)	.12
18. Problems with faculty and administration	(37)	.01	(37)	.18	(58)	.15	(64)	.04
20. Concern about large size of University	(27)	.07	(31)	.28**	(28)	.12	(36)	.15

Simulated Programmed counseling was as extensive as under conditions of normal counseling.

Three indices of flexibility are represented in the study and the results involving these indices are described below.

1. A point biserial correlation was obtained between the student's statement of his "degree of concern or need for information" before counseling and whether or not the problem was covered as judged by the student. These correlations are reported in Table 12 and a significant positive correlation indicates that the more serious the pre-counseling problem was the more likely it was to be covered in the interview. The results indicate that for all four conditions, flexibility of coverage occurs to a significant degree in regard to a number of problems. In some instances, coverage was too frequent or too infrequent to allow for a meaningful biserial correlation. Correlation. Correlations are also reported for each of the clusters of problems. The data in Table 12 suggest that significant flexibility occurs, that the degree of flexibility is slight in all conditions, and that there is some tendency for normal counseling to be more flexible than Programmed counseling and Simulated Programmed counseling. The most important differences between conditions involve scholastic problems having to do with information about courses, curricula, and scholastic requirements at the University where the Programmed counseling condition lacks flexibility. These items were not covered in the Self-Counseling Manual at all or were covered in an inflexible manner. Questions were frequently asked about these items in the interviews following Programmed and Simulated Programmed counseling.

2. A second index of flexibility consists of the correlation between the severity of the pre-counseling problem rating and the student's post-counseling

rating of degree of help received for those problems. The correlations represent a combination of whether or not the problem was covered and how helpful the counseling was if the problem was covered. A score of 0 is assigned if the problem was not covered and a rating of 1 to 5 if the problem was covered. The mixture of coverage and helpfulness is used because it seems reasonable to assume that non-coverage is not helpful. It must be noted that this is a crude scale in several respects. The correlation does indicate, however, the degree to which the counselor has covered a problem area and given help as related to the degree to which the student strongly indicates a problem in that area before counseling.

The data are summarized in Table 13 and indicate significant flexibility of help for all counseling conditions except for Simulated Programmed counseling where only two correlations are statistically significant. The two normal counseling conditions with a total of 26 significant correlations appear superior in flexibility in regard to degree of help received. The other two conditions of counseling produce only 9 significant correlations between them. In a number of instances there are statistically significant differences between the flexibility for different conditions and all of these involve a superiority of normal counseling over one or both of the Programmed conditions. These include problems of knowledge of scholastic aptitudes, adequacy of preparation for college, courses to be taken first semester, scholastic requirements at the University and the selection of a college major.

3. The third type of index of flexibility consists of the correlation between a problem which the student is deemed to have based on diagnostic information and coverage or degree of help received. Four problems were selected as defined below:

1. Underachievement. The index used was the difference between the student's high school rank and his score on the School and College Abilities Test.
2. Low Aptitude. The index was the score on the School and College Abilities Test.
3. Scholastic Expectations too High. The index was the difference between the student's expected grades and grades predicted from his tests and high school rank.
4. Inappropriate Interests. The index was the mean test score on interest tests listed as important in the Counseling Manual. A second index was the counselor's rating of appropriateness of interests.

A group of nineteen directors of college counseling centers supplied expert judgments as to which of thirty six problems should be covered in a counseling interview for students who had each of the four problems listed above. These expert opinions provide a basis for evaluating to some extent whether the problems covered by the counseling condition were the problems that should be covered for students with each of the problems above. These judgments were difficult to make but the rankings of which problem areas most need coverage for each of the above four problems are quite stable.

This analysis of flexibility assumes that the counselor has the responsibility for exploration of problem areas on the basis of diagnostic information which he may possess whether or not the student indicates need for such exploration. If the student has aptitudes which are likely to result in failure in college, certain problem areas should be explored. To the degree that appropriate problem areas are explored, the counseling condition may be said to be appropriately flexible.

The analysis of the data consisted of correlations between the index of seriousness for each of the four problems defined above and the degree to which each of the problem areas was covered. The results produce no more significant correlations than would be expected by chance between the presence of the problems and coverage, and tables summarizing these results are not included in the report. When those problem areas which the experts indicate should be covered most adequately in each case are examined, there also are no more than chance correlations. The data do not provide an adequate basis for comparing the different conditions of counseling.

Several factors may operate to limit the size of these correlations. While the experts agree as to the ranking of problems which most need to be covered, they also indicated that most problem areas may limit the possibility of flexibility in some cases. Also the counselor may be correct in not being flexible in some instances in the sense that he should not focus entirely upon problems which students have but also upon assets. For example, he may stress aptitude and preparation for college for the high aptitude student, and to do so may be just as important and appropriate as to do this for the low aptitude student.

Summary and Discussion

The evaluation of the flexibility of counseling under the four conditions cannot be said to be entirely satisfactory. How adequate some of the measures of flexibility are may be questioned. An attempt in the research was made to use ratings of transcribed interviews as a criterion of coverage of the various problem areas, but unsatisfactory reliability of judgment of coverage necessitated the abandonment of this procedure. The adequacy of the student's judgment of whether or not a topic was covered can also be questioned and the low correlations may be a function of poor reliability or validity of these judgments. Judgments by experts indicated agreement between them as to which problem areas ought to be covered most frequently, but it is difficult to select problems or symptoms where it can really be said that one problem area should be covered and others should not. The data having to do with the relation between a problem as stated by the student before the interview and coverage is clearer since it is clear that those problems which a student has or thinks he has should be covered by the counselor. These results are clearer and indicate the following tenative conclusions.

1. The evidence supports the hypothesis that coverage of the problem areas is as adequate for Programmed and Simulated Programmed counseling as for Normal-1 and Normal-2 counseling.

2. Flexibility in covering those problems which the student indicates he has before counseling occurs to a significant degree in all conditions, and the tendency (not statistically demonstrated) is for normal counseling to be more flexible than Programmed and Simulated Programmed counseling.

3. Correlations reflecting flexibility are quite low and suggest that counselors are not normally as flexible as one would expect.

4. Flexibility in covering and giving help on those problems which the student indicates he has before counseling occurs to a significant degree except perhaps in Simulated Programmed counseling. In this case the two normal counseling conditions provide a significantly higher percentage of significant correlations than the other two conditions.

5. The question of flexibility of coverage and helpfulness dependent upon diagnostic information which the counselor has available or could discover from the student was explored, but the analysis of this question does not seem adequate enough to justify any conclusions.

V. Changes in Expected Scholastic Achievement During Counseling

Part of the task of the counselor in a pre-college counseling interview is to inform the student about the scholastic standards of the college he plans to enter and to assist him to form a better estimate of the scholastic demands which will be placed upon him. In line with the purpose of the interview, changes in academic expectations of students are reported here under four conditions of counseling.

Previous studies of changes in scholastic expectations of students undergoing counseling do not reveal clear, positive findings. Young (1955) failed to find evidence of improvement in self-prediction of scholastic achievement as a result of counseling. Robertson (1960) did not find any significant improvement in prediction of college grades by 200 students participating in a three day pre-college testing and counseling conference. A whole series of research studies--Johnson (1953), Berdie (1954), Singer and Steffire (1954), Wright (1957), Froelich (1957), Robertson (1959) make it clear that improvements in self-estimates of ability and interest usually accompany counseling in which test interpretation is involved. If such is the case it would be expected that improved estimates of scholastic success would also follow, although it does not seem to have been demonstrated.

As a part of the questionnaire administered immediately prior to and immediately following the pre-college counseling interview, students estimated the grades they expected to achieve their first semester in college, the grades they thought they were capable of achieving, the hours they expected to study per week in college and the hours per week they thought they should study. Counselors also made predictions following the interview for each of their clients as to the grades they would achieve, the hours they should study and the hours they would study.

Students in the control group filled out the questionnaire on two occasions without a counseling interview intervening. On the first occasion, they filled it out at home and from three days to a week later filled it out on the University campus just prior to their counseling interview. Test-retest reliabilities are .69 for expected grade average; .58 for potential grade average; .85 for hours expected to study; .78 for hours one should study.

It was predicted that counseling should have the effect of changing student estimates of probable grade point average and expected hours of study in appropriate directions. Since most students underestimate the hours of study they may expect to put in and overestimate the probable grade point they will achieve, the appropriate changes are usually a raising of one's estimate of probable hours of study and lowering one's estimate of probable grade-point average.

Results

Tables 14, 15, and 16 summarize the effects of counseling in changing students expectations regarding grade-point average. The effect which counseling may have for the total group of students being counseled under any one condition will depend in part upon the size and direction of the difference between the client's scholastic expectations and the counselor's expectations. Table 14 lists the mean of the counselor's predictions of probable grade-point average for students in Normal counseling and Simulated Programmed counseling. Also, indicated for each condition of counseling and for the control group is the mean grade-point average predicted from test scores and high school rank. In the case of students in Normal-1 counseling, the estimate by the counselor is nearly indentical with that of the student so that change for the group

Table 14

Changes in Expected Grade-point Average Under Four Conditions of Counseling

Group Counseled	N	Pre-Counseling Estimate by Student	Grade Point Average Predicted	Counselor Estimate	Mean Change in Estimate	Difference Experimental Control
Control Group	95	3.81			-.02	
Normal-1 Counseling	95	3.81	3.52	3.82	-.02	.00
Normal-2 Counseling	96	3.88	3.19	3.50	-.13***	-.11*
Programmed Counseling	103	3.75	3.20		-.13***	-.11*
Simulated Programmed Counseling	93	3.77	3.22	3.52	-.10**	-.08

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*p = .05 one tailed test
**p = .01 one tail test
***p = .001 one tail test

Table 15. Changes in student estimates of grade point averages they could obtain under four conditions of counseling.

Group Counseled	N	Pre-Counseling Estimate	Mean change in estimate	Difference Experimental-Control
Control group	95	4.29	-.02	
Normal-1 Counseling	94	4.42	-.03	-.01
Normal-2 Counseling	98	4.37	-.145***	-.125*
Programmed Counseling	103	4.32	-.13**	-.11*
Simulated Programmed Counseling	93	4.34	-.125***	-.105*

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*p less than .05; one-tailed test
**p less than .01: one-tailed test
***p less than .001: one-tailed test

Table 16. Mean changes in expected grade point average for students who overestimated probable grade point average before counseling.

Group counseled	N	Mean Over-estimation score	Change in estimation	Difference Experimental-Control
Control Group	44	.539	-.07*	
Normal-1 counseling	49	.475	-.155**	-.085
Normal-2 counseling	70	.490	-.220***	-.15**
Programmed counseling	51	.407	-.265***	-.195***
Simulated Programmed Counseling	55	.599	-.180***	-.11**

**p less than .01; one tailed test

***p less than .001; one tailed test

as a whole would not be expected to occur. In the case of the other counseling groups, a lowering of expected grade-point average would be predicted. The data summarized in Table 14 clearly shows that significant appropriate change occurs in expected grade-point average for Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling and that these changes are significantly greater than for the control group in the case of Normal-2 counseling and Programmed counseling. Similarly, in Table 15, such changes occur for the student's estimate of grades he could achieve if he lived up to his potential. In this latter case, we do not have any clear way of stating what the correct estimate is since the counselors did not make this prediction and test data do not permit such a prediction. However, the changes follow closely the pattern of changes for expected grade-point average, and changes are significantly greater than the control group except for Normal-1 counseling. In Table 16, students who overestimated expected grade-point average before counseling are compared under the different conditions of counseling, and in this case all four counseling groups show significant changes.[1] Changes are significantly greater than the control group except for Normal-1 counseling.

In regard to expected grade-point average, the results indicate that significant, appropriate changes occur with counseling but that changes under the different conditions of counseling do not differ significantly from each other.

Since students under the Normal-1 condition expect grades at the same level as the counselors predict for them, this counseled group serves, also, as a kind of control group. In Table 14, Normal-2 counseling and Programmed counseling show significantly larger lowering of expected grade-point averages than is the case with Normal-1 counseling. The same significant differences appear in Table 15. This comparison adds further weight to the demonstration of significant effect of counseling in this respect since it implies that where the counselor, on the average, is being neutral, changes do not occur. However, when the counselor does predict lower grades than the client the change is significant in the appropriate direction.

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[1] The pre-counseling overestimation score for Program Counseling is considerably smaller than the control group. The significance level as indicated in the table is not changed when allowance for this is made by covariance.

A similar analysis of student expectations in regard to hours of study per week is summarized in Tables 17, 18, and 19. In Table 17, changes in expected hours per week of study are examined as related to the counselor's estimate as to how many hours per week the student should study. In every case, the average estimate by counselors is greater than the average estimate by students. The estimate of 32 hours listed as the Counselor's estimate under the Programmed counseling condition is derived from the fact that the Self-Counseling Manual indicated that students on the average should study 2 hours outside of class for every hour in class which would approximate 32 hours per week. The changes in Table 17 should, therefore, result in increases in expected hours per week of study. Such increases are found for all conditions of counseling and Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling show significantly larger increases in estimate than the control group. Changes under the conditions of Normal-2 counseling and Simulated Programmed counseling are also significantly larger than changes under Normal-1 counseling at .001 and .01 levels respectively. Smaller changes might be expected for Normal-1 counseling since the defective norms resulted in similar perceptions by student and counselor

Table 17. Changes in estimates of hours per week students expect to study under four conditions of counseling.

Group Counseled	N	Pre-Counseling Estimate	Counselor Estimate	Mean change in Estimate Post-pre	Difference Experimental-Control
Control group	97	26.35		.55	
Normal-1 counseling	93	27.45	32.30	1.40*	+85
Normal-2 counseling	98	26.45	35.55	4.39***	+ 3.75***
Programmed counseling	103	25.60	32.00	2.75***	+ 2.20**
Simulated programmed counseling	93	26.00	35.25	3.65***	+ 3.10***

**p less than .01; one tail test
*p less than .05; one tail test
***p less than .001; one tail test

Table 18. Changes in estimates of hours per week students believe they should study.

Group counseled	N	Pre-Counseling Estimate	Counselor Prediction	Mean change in estimate Post-pre	Difference Experimental-Control
Control group	92	33.25		.50	
Normal-1 Counseling	93	33.25	32.30	.35	-.15
Normal-2 Counseling	98	31.90	35.55	3.40***	2.90***
Programmed counseling	103	31.55	32.00	2.40***	1.90**
Simulated Programmed counseling	93	31.60	35.25	2.60***	2.10***

**p = .01; one tailed test
***p = .001; one tailed test

Table 19. Changes in hours per week students expect to study for students who underestimate need to study before counseling.

Group Counseled	N	Pre-Counseling Estimate	Change in Estimate Post-pre	Difference Experimental-Control
Control Group	32	23.60	1.10*	
Normal-1 counseling	40	22.00	2.13**	1.13
Normal-2 counseling	51	23.05	6.10***	5.00***
Programmed counseling	54	22.60	3.95***	2.85***
Simulated Programmed counseling	46	22.70	5.00***	3.90***

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*p = .05; one tailed test
**p = .01; one tailed test
***p = .001; one tailed test

of aptitudes and probable grades. Consequently, counselors would be less likely to urge more study on the part of students.

Also in Table 17, Normal-2 counseling results in significantly larger change ($p = .05$) than Programmed counseling.

Similar results are indicated in Table 18 in regard to hours per week which students believe they should study. Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling show significant increase in estimates of hours students should study, significantly greater increases than the control group, and significantly greater increase than Normal-1 counseling.

Table 19 summarizes changes in expected hours per week of study for students judged to have underestimated the hours per week they should study. Students are selected where the hours they expect to study are clearly less than the hours recommended by counselor's for students of their level of ability and high school achievement. For students so selected, changes in expected hours of study are summarized in Table 19. The results are similar to those in Tables 17 and 18. Even the control group changes significantly in the appropriate direction but Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling show significantly greater changes than the control group or than Normal-1 counseling. Here, as in Table 4, students in Normal-2 counseling show significantly greater changes ($p = .05$) than students in Programmed counseling.

Summary and Discussion

The results may be summarized as follows:

1. Changes in scholastic expectations in appropriate directions occur during counseling.

2. Appropriate changes during counseling are significantly greater than

with a control group.

3. Changes during counseling are greater where the counselor (or Self-Counseling Manual) believes that there should be changes in scholastic expectations.

4. No superiority of one counseling condition over another is indicated in regard to changes in expected grade-point average.

5. In regard to expected hours to study per week, Normal-2 counseling shows the largest change, Simulated Programmed counseling the next largest change, and Programmed counseling the least change. The change under the Normal-2 counseling condition is significantly greater ($p = .05$) than under the Programmed counseling condition.

The results of the study clearly indicate the effectiveness of counseling in producing appropriate changes in scholastic expectations.

The only significant difference between counseling conditions is found in regard to hours the student expects to study where the presence of a live counselor under the conditions of normal counseling result in larger increases than occur without the presence of the counselor. This might be interpreted as meaning that when the student is making a resolution about a change in behavior in the future, the personal relationship is important. However, it does not seem important when the student is predicting his probable grades. This superiority of normal counseling must be interpreted in the light of other findings in the research project.

VI. Changes in Student Estimates of Appropriateness of Curricular Choice During Counseling.

One purpose of the counseling interviews under study is to assist the student to more adequately evaluate the appropriateness of his choice of a major field in college. Where students have overestimated or underestimated the appropriateness of these choices they should reevaluate their estimates and should more correctly evaluate the appropriateness of their choice after counseling than before.

Previous studies have shown that counseling can be effective in changing student estimates of the appropriateness or suitability of their curricular or vocational choice. Chernow (1956) found increased recognition of suitability of vocational choice by clients undergoing personal adjustment counseling with a mean of 16 interviews. Gonyea (1962) has shown that significant changes in vocational objectives in an appropriate direction are associated with vocational counseling of college students when an immediate post-counseling statement of the choice is compared with a pre-counseling statement of the choice. He also found vocational objectives which were stated a year later were significantly more appropriate than the pre-counseling objectives.

Procedure

In the present study students estimated the degree to which their abilities and their interests were suitable for their choice of a major field in college. Each rating was on a four-point scale. This estimate was made immediately preceding and immediately following the counseling interview.

Two separate indices of suitability of interests and abilities were used in the study.

One index of suitability was derived from the actual test scores as used in the Self-Counseling Manual. In this case the mean decile score of those ability tests listed as important for the major field in question was computed. This mean score was the index of suitability of the choice as far as abilities were concerned. A similar procedure yielded an index of suitability of the choice as far as interests were concerned. Each of these indices was transformed into a scale such that a difference between the index and the student rating of suitability could be taken as an index of the accuracy of his estimate of suitability.

The second index was the counselor's estimate of suitability as rated immediately following the interview with the student. This index is not present for students undergoing Programmed counseling or students in the control group who did not see a counselor. In this case the difference between the counselor's estimate of suitability and the student's estimate is taken as the index of the accuracy of the student's estimate of suitability of interests or abilities.

The reliability of student estimates of suitability of abilities based on a test-retest correlation for the control group is .45 and the reliability for interests is .41. These are unsatisfactory reliability figures, and the fact that they are used as a part of a difference score in the analysis adds further doubt regarding probability of obtaining clear results in this study.

The hypothesis to be tested states that changes during counseling will occur such that student estimates of suitability will be more accurate after the interview than before.

Table 20 presents a comparison of the four counseled groups and the control group in terms of the degree to which pre-counseling error in estimates of

Table 20. Correlations between pre-counseling error in estimates of suitability and change in estimates in an appropriate direction.

Test Scores as index of suitability	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling		Control Condition	
	N	r	N	r	N	r	N	r	N	r
Ability estimates	83	.30**	87	.28**	87	.43**	82	.24*	85	.14
Interest estimates	91	.14	92	.21	94	.25	92	.02	91	.13
Counselor rating as index of suitability										
Ability estimates	93	.44**	94	.20*			93	.43**		
Interest estimates	94	.43**	93	.29**			93	.60**		

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*p less than .05
**p less than .01

suitability is correlated with change in estimates of suitability in an appropriate direction. A positive correlation reflects a tendency for overestimators to reduce their suitability estimates and for underestimators to raise their suitability estimates. Estimates in terms of interests and abilities are presented. When the index used is based on test data as presented in the Self-Counseling Manual and when ability estimates are involved, significant positive correlations are found for all four counseled groups and not for the control group. The positive non-significant correlation for the control group may be the result of a regression effect. There are no significant differences between the correltations for the four counseling conditions. Only the Programmed counseling condition yields a significantly greater correlation than the control group (p less than .05). In the case of interests, only Programmed and Normal-2 counseling conditions yield significant positive correlations and these correlations are not significantly greater than the correlation for the control condition.

When the index used is based on the counselor estimate of suitability only Normal-1, Normal-2, and Simulated Programmed counseling may be included in the analysis, and positive correlations are significant for all groups for both abilities and interests. Simulated Programmed counseling yields a significantly larger correlation than Normal-2 counseling in the case of both interests and abilities (p less than .03 and .01 respectively).

In addition to this correlational analysis, the mean reduction in error in the estimates of suitability is compared under the various conditions in Table 21. Where the mean test scores as presented in the Self-Counseling Manual are used as the index of suitability, Programmed counseling yields significant changes in terms of both abilities and interests and in both cases significantly greater than the control group (p less than .05 and .01 respectively). These differences are not accounted for by differences in mean pre-counseling error scores. None of the other

Table 21. Mean reduction during counseling of estimate of suitability of interests and abilities.

	Mean reduction in error during counseling									
	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling		Control Condition	
Test scores as index of suitability	N	$\bar{x}$	N	$\bar{x}$	N	$\bar{x}$	N	$\bar{x}$	N	$\bar{x}$
Ability estimates	83	.10	88	-.07	87	-.22**	82	-.02	85	.00
Interest estimate	91	.01	92	-.02	94	-.14*	92	.04	91	.13
Counselor rating as index of suitability										
Ability estimates	93	.03	94	.06			93	-.09		
Interest estimate	95	.05	96	.02			93	-.04		

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*p less than .05
**p less than .01

groups show significant changes. Where the counselor rating of suitability is used as the index, none of the groups (Normal-1, Normal-2, and Simulated Programmed counseling) show significant changes.

Summary and Discussion

1. The hypothesis that counseling will be effective in increasing accuracy of estimates of suitability of interests and abilities for the chosen major field in college is generally supported although significant appropriate changes do not occur in all instances.

2. Programmed counseling is the only condition where appropriate changes are significantly larger than for the control group. However, it must be noted that the index of suitability used is that stated in the Self-Counseling Manual, and this fact tends to favor the Programmed and Simulated Programmed conditions. Programmed counseling does not result in significantly larger changes than the other conditions of counseling.

3. Where the counselor ratings are used as the index of suitability (Programmed counseling and the control group cannot be used in these comparisons) significant correlations between pre-counseling error in estimate and change are found, but significant mean reductions in error do not occur. Examination of the data suggests that students often overcorrect their errors in these cases.

4. Simulated Programmed counseling (with counselor rating as the index of suitability) results in significantly larger appropriate correlations than does Normal-2 counseling. This may be the result of more emphasis on test scores as related to curricular choice under the Simulated Programmed condition.

5. An analysis of differences between counselors in regard to changes which their students made in these estimates does show differences existing between counselors but no consistent trends.

VII. Changes in Self Estimates of Abilities and Interests During Counseling and Following Counseling.

A major function of the pre-college counseling interview is to give the student information in regard to his abilities and interests and how they compare with those of other students entering the same college. If the student incorrectly estimates his abilities and interests prior to the counseling interview, he should be able to more correctly estimate his abilities and interests following the interview. In order to evaluate learning efficiency under the different conditions of counseling being studied, the amount and direction of change must be evaluated.

Learning to revise self-estimates in regard to abilities and interests involves learning which has serious personal implication to the learner. In many cases the learning requires that the student lower his self-estimates in regard to his scholastic abilities and such abilities have not only important meaning to him in regard to future academic performance but significant prestige connotations to him also. Consequently much of the learning required of the student is of the sort where emotional defenses or other aspects of personality become involved. In some ways such learning, especially the lowering of one's self estimates in specified respects, is a prototype of learning required in much counseling and psychotherapy and, as such, the personal relationship with the counselor or therapist is deemed to be of much importance according to most theoretical viewpoints. Consequently, it is important to evaluate the degree to which the learning to revise one's self estimates is dependent upon the presence of another person who, in his counseling, attempts to facilitate the acceptance of revised self-estimates.

The major hypothesis under study states that learning will be as efficient where the personal relationship factor is not present as when it is present. Also, it is hypothesized that the standardization of the interview involved in two of the conditions of counseling will not interfere with such learning. A third hypothesis states that the training experience involved in the writing of the Self-Counseling Manual will result in increased counseling effectiveness on the part of the counselors involved in the project.

Previous studies have shown that counseling interviews similar to those reported on here, do result in changes in self-estimates of abilities and interests in appropriate directions. Berdie (1954) and Arsenian (1942) found that students who received counseling could estimate their vocational interest scores more accurately than a control group who received no counseling, but the finding did not hold for estimates of abilities. Johnson (1953) reports significant growth in self-knowledge following vocational counseling. Robertson (1959) found significant changes in some estimates of ability during a pre-college counseling program, but the appropriateness of these changes was not stated. Singer and Stefflre (1954) found improved understanding of self especially in regard to estimates of interest test scores. In a comparison of group and individual test interpretation, Wright (1957) found increased congruence between self-estimates and test estimates of aptitude and achievement for both group and individual counseling but such changes were significant for individual counseling only where interests were involved. A control group did not show these changes. Froelich (1957) found significant improvement of self-knowledge of aptitude associated with counseling. These research studies make it clear that improvements in self estimates of ability and interest usually accompany counseling in which test interpretation is involved. Such improvements may, therefore, be used as a valid partial criterion of successful counseling of this type.

Several studies have involved differences in type of test interpretation. Holmes (1961), found that four methods of test interpretation with varying degrees of student participation did not differ in effectiveness, but all had significant effect in increasing self understanding. Rogers (1954), found both a test centered method and a self-evaluation method of test interpretation to contribute to improved self understanding of college students with respect to abilities and also found no difference in effectiveness between the two methods of test interpretation. Also, Gustad and Tuma (1957), did not find any relation between differing degrees of counselor responsibility for test interpretation and client learning from the interview. However, Dressel and Matteson (1950), found increased self understanding of characteristics tested related to degree of client participation in the counseling interview. Since the Programmed Counseling condition in the present study does involve considerable responsibility on the part of the client in interpreting his own test results these findings are of interest.

Two previous studies by Arsenian (1942) and Torrence (1954), also show evidence for heavy overestimation of scholastic abilities as is the case with with the present study.

Procedure

Each student estimated various abilities and interests in terms of how he compared with the entering freshman class at the University of Illinois in regard to various abilities and interests. These self estimates are similar to those reported by Berdie (1954) and concern abilities and interests on which test information was available for the counselor to use in the counseling interview. The estimates were made immediately preceeding and immediately following the counseling interview or the reading of the Programmed Counseling Manual.

The same estimates were made again by students at the time of the end-of-semester questionnaire which was administered to students during the last two weeks of the first semester in college. Several different measures are used as reflections of the degree and direction of change in these estimates.

Results

The results of the analysis of changes in ability and interest estimates are discussed in three sections. The first section below presents an analysis of changes in ability estimates which represent the amount of decrease in overestimation of abilities. Most students overestimate their abilities and a change which is a decrease in estimate is the appropriate change. These results are presented in Tables 23 through 27 and represent changes which always involve the student lowering his self-estimates. Consequently the acceptance of negative information about oneself is involved in these changes. The personal relationship factor in counseling has been thought to be of particular importance in such cases. The second section summarizes changes during counseling in the reduction of error in estimates of ability. The reduction of error reflects changes which may be either increases or decreases in estimates of abilities. While reduction in error in the majority of cases requires a decrease in estimate of ability, the acceptance of both favorable and unfavorable information is involved in these changes. The third section summarizes the changes in interest estimates in terms of reduction of error.

1. Decrease in overestimation of abilities

Table 22 summarizes the test-retest reliability coefficients for estimates of abilities based on the control group students who were tested and retested approximately a week later without counseling intervening. These coefficients indicate considerable reliability and stability in the estimates.

Table 22. Test-Retest Reliability Coefficients for Estimates of Abilities

(N = 97)

Ability Estimated	r test-retest
1. General aptitude for college	.772
2. Verbal Aptitude	.800
3. Numerical Aptitude	.842
4. Proficiency in Science	.780
5. Proficiency in Social Science	.789
6. Proficiency in English	.810
7. Proficiency in Mathematics	.868
8. Reading Speed	.812
9. Reading Comprehension	.879
10. Vocabulary	.842

Table 23 presents the differences between the mean of the pre-counseling estimates by the students and the mean test deciles. These differences are quite similar for the various groups except that the mean differences for the Normal-1 group are markedly smaller than for the other groups. This is the result of a change in test norms which was required between the summer of 1962 when Normal-1 students were interviewed and the summer of 1963 when the other groups of students were interviewed. The differences listed in Table 2 for Normal-1 students are differences based on test scores as reported to students on the basis of 1962 norms. Actual tested abilities are similar for Normal-1 students and students in the other groups. Because of this variation in norms, differences between the Normal-1 group and the other counseled groups in changes in estimates of abilities cannot be attributed to differences in effectiveness of counseling. Normal-1 data is included in the tables since it provides an additional kind of control group.

Table 24 summarizes the mean changes in estimates of scholastic abilities for the four conditions of counseling and for the control condition. Significant lowering of estimates occurs for most groups and is appropriate since most students originally overestimated their abilities. In a few instances students in the control group also lower their estimates to a significant degree, and Table 25 presents a comparison of the counseled groups and the control group. The amount of decrease in estimate in the control group is subtracted in each case from decreases in the counseled groups. The amount of negative change in Table 25 represents, therefore, the degree to which the decrease in estimate in each case is greater than the decrease in the control group. Significant decreases occur for all counseled groups as compared with the control group. Programmed counseling provides the largest changes and

Table 23. Differences between Estimated and Tested Abilities under four conditions of counseling.

Difference: Pre-counseling estimated decile minus Test decile

Ability estimated	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Control Group
1. General Aptitude for College	-.42	1.86	1.68	1.75	1.63
2. Verbal Aptitude	-.34	1.20	.93	.85	1.06
3. Numerical Aptitude	-.77	1.55	1.61	1.84	1.57
4. Proficiency in Science	.19	1.73	1.32	1.59	1.07
5. Proficiency in Social Science	.47	1.75	1.68	1.65	1.34
6. Proficiency in English	.69	1.97	1.52	1.56	1.72
7. Proficiency in Mathematics	.26	1.88	1.61	2.09	1.24
8. Reading Speed	.00	.68	.64	.75	.70
9. Reading Comprehension	.08	1.40	1.28	1.30	1.07
10. Vocabulary	-.40	1.40	1.17	1.12	1.28

Table 24. Mean Changes in Estimates of Scholastic Abilities for Four Conditions of Counseling

Change: Post-counseling estimate minus pre-counseling estimate

Aptitude estimated	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Control Group
1. General Aptitude for college	.20	-.49*	-1.06**	-.87*	-.14
2. Verbal Aptitude	.07	-0.72*	-.82**	-.39	-.20
3. Numerical Aptitude	-.14	-.42	-1.03**	-.57*	-.22*
4. Proficiency in Science	-.09	-.47	-.68*	-.58*	-.25*
5. Proficiency in Social Science	-.35*	-.57*	-.80**	-.66**	-.41**
6. Proficiency in English	-.39*	-.85**	-.79**	-.85**	-.30**
7. Proficiency in Mathematics	-.13	-.49	-.80**	-.43	-.19
8. Reading Speed	-.24	-.66*	-.58*	-.31	-.14
9. Reading Comprehension	.21	-.74**	-.96**	-.54*	-.13
10. Vocabulary	.12	-.76**	-.89**	-.57*	-.14

*p less than .05 (one-tailed test)

**p less than .01 (one-tailed test)

Table 25. Changes in estimates of abilities for counseled students as compared with changes in estimates under the control condition.

	Decrease in estimates for counseled students minus decrease in estimates for control students.			
	Normal-1 minus Control	Normal-2 minus Control	Programmed minus Control	Simulated Programmed minus Control
1. General ability for college	.34*	-.35*	-.92**	-.73**
2. Verbal Ability	.27	-.52*	-.62**	-.19
3. Numerical Ability	.08	-.20	-.81**	-.35**
4. Proficiency in science	.16	-.22	-.43	-.33
5. Proficiency in social science	.06	-.16	-.39*	-.25
6. Proficiency in English	-.09	-.55**	-.49*	-.55*
7. Proficiency in Mathematics	.06	-.30	-.61**	-.24
8. Reading Speed	-.10	-.52**	-.44	-.17
9. Reading Comprehension	.34*	-.61**	-.83**	-.41*
10. Vocabulary	.26	-.62**	-.75**	-.43*

*p less than .05 (one-tailed test)

**p less than .01 (one-tailed test)

Normal-2 counseling and Simulated Programmed counseling also provide significant appropriate changes. Normal-1 counseling provides only two significant changes which are in the opposite direction presumably because of norm differences mentioned above. There are no significant differences between the counseling conditions for students participating in Programmed counseling, Simulated Programmed counseling, and Normal-2 counseling.

Table 26 presents the changes which occur in these estimates from the time of the pre-counseling estimate until an estimate made by the student from four to six months later, at the end of his first semester in college. These data include only those students who completed the first semester in college and filled out a questionnaire at that time. Significant decreases are present at the end of the semester for most abilities for all four conditions of counseling. It will be noted that significant decreases are now present for Normal-1 students which indicate that the experience of a semester in college has the effect of lowering these self-estimates. Even so, decreases for Normal-1 students are significantly smaller than the other three groups for the estimate of Vocabulary, smaller than Normal-2 and Programmed Counseling for estimate of Proficiency in Science and Reading Comprehension, and smaller than Programmed Counseling for estimate of Reading Speed. Decreases in estimates for the other three counseled groups do not differ significantly from each other.

Table 27 presents the degree of overestimation of abilities as of the end of the semester for the four counseled groups and for a group of students who had not seen a counselor in the Student Counseling Service up to that time. Overestimation is significantly smaller for counseled students in a number of

Table 26. Mean Changes in Estimates of Abilities from the Time of the Pre-counseling Rating until the End of the First Semester in College.

Ability Estimated	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling
	Mean	Mean	Mean	Mean
1. General Aptitude for college	-.346*	-.558**	-.805**	-.582**
2. Verbal Aptitude	-.244*	-.430**	-.632**	-.430*
3. Numerical Aptitude	-.423**	-.477**	-.632**	-.734**
4. Proficiency in Science	-.564**	-1.151**	-1.046**	-1.000**
5. Proficiency in Social Science	-.769**	-.872**	-.831**	-1.253**
6. Proficiency in English	-.231	-.477	-.529	-.582
7. Proficiency in Mathematics	.-462	-.651**	-.540*	-.810**
8. Reading Speed	-.167	-.593**	-.736**	-.443*
9. Reading Comprehension	-.192	-.616**	-.724**	-.570**
10. Vocabulary	.064	-.581**	-.908**	-.544**

**p less than .01; one tailed test.

*p less than .05; one tailed test.

Table 27. Degree of Overestimation of Abilities at the End of the First Semester in College for three Counseled Groups and a Non-counseled Group.

	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Non-counseled Group
	Mean	Mean	Mean	Mean
1. General aptitude for college	1.26	.66**	1.06**	1.92
2. Verbal aptitude	1.02	.17**	.37**	1.35
3. Numerical aptitude	.97**	.83**	.84**	2.09
4. Proficiency in science	.76	.17**	.75	1.34
5. Proficiency in social science	1.02	.93	.71	1.26
6. Proficiency in English	1.52	.97	1.20	1.71
7. Proficiency in mathematics	1.26	.90	1.53	1.18
8. Reading speed	.26*	-.10**	.32*	1.12
9. Reading comprehension	.58**	.44**	.67**	1.67
10. Vocabulary	.87	.15**	.42	.96

** p less than .01 that overestimation is al large as for non-counseled group.

* p less than .05 that overestimation is as large as for non-counseled group.

instances. These differences lend support to the thesis that this effect of counseling persisted to the end of the semester. No estimate of abilities was made by the non-counseled students prior to college entrance, so comparability in this respect to the counseled groups cannot be established. The non-counseled group has slightly lower ability test scores than the counseled groups, and there is a negative correlation between overestimation of test scores and size of test score. These correlations are approximately .70. If allowance is made for the size of the correlation and the degree of difference in abilities as tested, there still would be significant differences approximately as indicated in Table 27.

2. Changes in error in student estimates of abilities

The error in the student estimate in each case consists of the difference obtained when the actual test score decile is subtracted from the student's estimate of his decile and the sign is removed. As is the case with the overestimation of abilities, Normal-1 students are compared with test deciles based on different norms and this must be taken into account in the interpretation of the results.

Table 28 presents the mean error in the pre-counseling estimates of scholastic abilities for the four conditions of counseling and the control group. The error is smaller for Normal-1 students as would be expected, but differences are small between the scores for other groups.

Table 29 presents the reduction in error during counseling for the four counseled groups and the control group. All counseling conditions result in significant decreases in error and the control group does not.

Table 28. Mean error in pre-counseling estimates of scholastic abilities under four conditions of counseling and control group.

Aptitude estimated	Normal-1 Counseling		Normal-2 Counseling		Programmed Counseling		Simulated Programmed Counseling		Control Group	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
1. General Aptitude for college	96	1.50	99	2.61	105	2.69	95	2.59	97	2.39
2. Verbal Aptitude	96	1.65	99	2.42	105	2.83	95	2.20	97	2.18
3. Numerical Aptitude	96	1.58	99	2.11	105	2.57	95	2.72	97	2.28
4. Proficiency in Science	93	1.73	96	2.42	99	2.30	86	2.79	97	1.86
5. Proficiency in Social Science	93	2.22	96	2.63	99	2.43	86	2.56	97	2.53
6. Proficiency in English	93	2.12	96	2.59	99	2.60	86	2.71	97	2.62
7. Proficiency in Mathematics	93	1.42	96	2.29	99	2.30	86	2.93	97	1.94
8. Reading Speed	96	2.01	99	2.34	105	2.45	95	2.15	97	2.06
9. Reading Comprehension	96	1.70	99	2.54	105	2.40	95	2.26	97	1.99
10. Vocabulary	96	1.67	99	2.46	105	2.08	95	2.24	97	2.21

Table 29. Reduction of error during counseling in estimating scholastic abilities under four conditions of counseling

	Aptitude estimated	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Control Group
		Mean	Mean	Mean	Mean	Mean
1.	General Aptitude for college	.427***	.354**	1.676***	1.305***	.062
2.	Verbal Aptitude	.271**	.727***	1.210***	.768***	.010
3.	Numerical Aptitude	.073	.303*	1.048***	.453**	.165
4.	Proficiency in Science	.290*	.292*	1.030***	.651***	-.113
5.	Proficiency in Social Science	.645***	.656***	.949***	.651***	.041
6.	Proficiency in English	.613***	.885***	1.091***	.930***	.186
7.	Proficiency in Mathematics	.366***	.312**	.586***	.442***	.000
8.	Reading Speed	.854***	.556***	1.505***	.758***	.010
9.	Reading Comprehension	.604***	.778***	1.524***	.863***	-.062
10.	Vocabulary	.698***	.657***	1.067***	.853***	.155

*** p=.001
** p=.01
* p=.05

Table 30 compares reduction in estimated error of the counseled groups with the control group. All counseled groups show significantly greater reduction in error in some instances than the control group.

Table 31 compares changes in error among the counseling conditions except for the Normal-1 condition. Programmed counseling is superior to Normal-2 counseling and to Simulated Programmed counseling in error reduction in regard to several estimates. These differences cannot be accounted for by regression effects. Simulated Programmed counseling is superior to Normal-2 counseling in regard to one item and is not accounted for by a regression effect.

Table 32 presents changes in error estimate under the four counseling conditions from the time of the pre-counseling questionnaire until the end-of-semester questionnaire. All counseling conditions provide significant reductions in error persisting until the end of the first semester in college.

Table 33 compares the different counseling conditions in amount of reduction of error from the time of the pre-counseling rating to the end-of-semester rating. Significant differences favor Programmed counseling and Simulated Programmed counseling over the normal conditions. Differences between Programmed and Simulated Programmed counseling are not significant.

Table 34 compares the error in ability estimates as of the end of the first semester in college for the four counseled groups and the non-counseled group. Error scores are smaller for counseled than non-counseled students and especially so for Programmed and Simulated Programmed counseling. The evaluation of these differences must take into account the correlation between error in estimate of abilities and the actual test scores. The higher the actual test score, the lower the error in estimates of abilities tend to be. These

Table 30. Differences between Counseling Conditions and the Control Group in Reduction of Error in Estimating Scholastic Abilities.

	Normal-1 minus Control Mean	Normal-2 minus Control Mean	Programmed minus Control Mean	Simulated Programmed minus Control Mean
1. General aptitude for college	.365**	.292	1.614**	1.243**
2. Verbal aptitude	.261	.717**	1.200**	.758**
3. Numerical aptitude	-.092	.138	.883**	.288
4. Proficiency in science	.342*	.426**	1.018**	.776**
5. Proficiency in social science	.553**	.605	.854**	.612**
6. Proficiency in English	.366*	.723**	.843**	.772**
7. Proficiency in Mathematics	.302*	.323*	.533*	.442**
8. Reading Speed	.844**	.546**	1.495**	.748**
9. Reading Comprehension	.666**	.840**	1.586**	.925**
10. Vocabulary	.543**	.502**	.912**	.698**

**p less than .01; one tailed test
*p less than .05; one tailed test

Table 31. Differences between Counseling Conditions in Reduction of Error in Estimating Scholastic Abilities.

Aptitude rated	Difference in amount of reduction of error		
	Programmed minus Normal-2 Counseling	Simulated Programmed minus Normal-2 Counseling	Programmed minus Simulated Programmed Counseling
	Mean	Mean	Mean
General College Ability	1.32***	0.95***	0.37
Verbal Ability	0.48*	0.04	0.44
Numerical Ability	.75**	.15	.60*
Proficiency in Science	.74**	.36	.38
Proficiency in Social Science	.29	-.01	.30
Proficiency in English	.21	.05	.16
Proficiency in Mathematics	.27	.13	.14
Reading Speed	.95***	.20	.75**
Reading Comprehension	.75**	.09	.66**
Vocabulary	.41*	.20	.21

***p = .001
** p = .01
* p = .05

Table 32. Reduction in Error in Ability Estimates from the time of the Pre-counseling Rating until the end of the First Semester in College.

Ability Estimated	Reduction in error			
	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling
1. General college ability	-.141	.116	.253	.684*
2. Verbal ability	-.013	.337**	.379*	.430**
3. Numerical ability	-.295*	-.198	.563**	.709**
4. Proficiency in Science	.128	.105	.609**	.848**
5. Proficiency in Social Science	.000	.407**	.471**	.570**
6. Proficiency in English	.179	.221*	.253	.405*
7. Proficiency in Mathematics	-.179	.419**	.287*	.684**
8. Reading Speed	.090	.500**	.690**	.342*
9. Reading Comprehension	-.244*	.407**	.655**	.215
10. Vocabulary	.269*	.419**	.563**	.316*

**p less than .01; one tailed test
*p less than .05; one tailed test

Table 33. Differences between Counseling Conditions in Reduction in Error from the Time of the Pre-counseling Rating until the End-of-semester Ratings

Ability Estimate	Programmed minus Normal-1	Programmed minus Normal-2	Programmed minus Simulated	Simulated Programmed minus Normal-1	Simulated Programmed minus Normal-2	Normal-2 minus Normal-1
1. General college ability	.394	.137	-.431	.825**	.568*	.257
2. Verbal ability	.392	.042	-.051	.443*	.093	.350
3. Numerical ability	.858**	.761**	-.146	1.004**	.907**	.097
4. Proficiency in Science	.481*	.504*	-.239	.720**	.743**	-.023
5. Proficiency in Social Science	.471*	.064	-.099	.570*	.163	.407*
6. Proficiency in English	.074	.032	-.152	.226	.184	.042
7. Proficiency in Mathematics	.466*	-.132	-.397	.863**	.265	.598**
8. Reading Speed	.600**	.190	.348	.252	-.158	.410
9. Reading Comprehension	.899**	.248	.440	.459	-.192	.163
10. Vocabulary	.294	.144	.247	.047	-.103	.150

**p less than .01; two tailed test
*p less than .05; two tailed test

Table 34. Error in Estimation of Abilities at the End of the First Semester in College for Three Counseled Groups and a Non-Counseled Group.

	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Non-Counseled Group
	Mean	Mean	Mean	Mean
1. General aptitude for college	2.30	2.29	1.85**	2.64
2. Verbal Aptitude	1.98	1.94	1.63**	2.33
3. Numerical aptitude	2.27	1.91**	1.90**	2.68
4. Proficiency in science.	2.48	1.83**	2.11	2.60
5. Proficiency in social science	2.23	2.06	2.18	2.42
6. Proficiency in English	2.41	2.41	2.52	2.52
7. Proficiency in mathematics	2.09	2.00	2.49	2.34
8. Reading speed	1.91**	1.53**	1.84**	2.56
9. Reading comprehension	2.07	1.63**	1.99*	2.42
10. Vocabulary	1.97	1.48*	1.86	2.08

**p less than .01 that error is as large as for non-counseled group.

* p less than .05 that error ic as large as for non-counseled group.

correlations range from .28 to .53. When account is taken of these correlations and the amount of difference in actual test scores between the control and the counseled groups, the results as indicated in Table 34 are not changed significantly.

3. Changes in error in estimates of interests

The data for estimates of interests was subjected to the same analysis as the data for ability estimates. However, only the analysis involving errors in estimates of interests is presented, because overestimation of interests is not consistently present before counseling as is the case with abilities. There is some tendency for these male students to overestimate their mechanical and persuasive interests and to underestimate their artistic and literary interests.

Table 35 presents the test-retest reliability coefficients for interest estimates for the control group who were tested and retested approximately a week later without counseling intervening. Considerable stability and reliability in these estimates is indicated.

Table 36 presents the mean error in the pre-counseling estimates of interests for the four conditions of counseling and the control group. These error scores are generally similar for the different conditions with a few exceptions.

Table 37 presents the mean reduction of error during counseling for the four counseling conditions and the control group. It is clear that Programmed and Simulated Programmed counseling show the largest error reductions, but Normal-1 and Normal-2 counseling also produce significant error reduction in some cases.

Table 38 presents the difference between mean reduction in error in the control group and in each of the counseling groups. Reduction in error in

Table 35. Test Retest Reliability Coefficients for Estimates of Interests (N=97)

Interest Estimated	$r_{\text{Test-retest}}$
Outdoor	.868
Mechanical	.821
Computational	.833
Scientific	.741
Persuasive	.740
Artistic	.793
Literary	.827
Musical	.871
Social Service	.861
Clerical	.820
Engineering	.907
Physician	.824

Table 36. Mean Error in Pre-counseling Estimates of Interests under Four Conditions of Counseling and for the Control Group.

Interests	Normal-1 Counseling (N=96)	Normal-2 Counseling (N=99)	Programmed Counseling (N=105)	Simulated Programmed Counseling (N=96)	Control Group (N=97)
1. Outdoor	2.448	2.313	2.533	2.187	2.598
2. Mechanical	2.240	2.323	2.286	2.354	2.474
3. Computational	1.750	2.051	2.343	2.177	2.969
4. Scientific	1.719	1.980	2.019	1.885	3.629
5. Persuasive	2.656	2.909	2.590	2.542	2.629
6. Artistic	2.312	2.222	2.181	2.208	3.000
7. Literary	2.250	2.313	2.543	2.635	2.309
8. Musical	2.062	1.899	2.390	1.927	2.814
9. Social Service	2.260	2.182	2.410	2.208	2.082
10. Clerical	2.562	2.758	2.514	2.635	2.907
11. Interests like Engineers	2.302	2.323	2.400	2.187	3.144
12. Interests like Physicians	2.094	1.949	2.257	2.104	

Table 37. Reduction of Error in Interest Estimates under Four Conditions of Counseling and the Control Condition

	Mean reduction in error in interest estimate				
Interest estimated	Normal-1 Counseling (N=96)	Normal-2 Counseling (N=99)	Programmed Counseling (N=105)	Simulated Programmed Counseling (N=96)	Control Condition (N=97)
1. Outdoor	.187	.242	.933**	.625***	.196*
2. Mechanical	.260*	.414**	.857**	.708**	-.052
3. Computational	-.281*	.162	.790**	.542**	.072
4. Scientific	.094	-.091	.381**	-.021	.041
5. Persuasive	.500**	.616**	1.000**	.615**	-.103
6. Artistic	.333*	-.081	.657**	.490**	.247
7. Literary	.458**	.020	.552**	.719**	-.010
8. Musical	.219	.000	.619**	.469**	.062
9. Social Service	.396**	.000	.610**	.510**	-.021
10. Clerical	.281	.091	.495**	.385*	.206
11. Interests like Engineers	.344**	.162	.410**	.208*	.052
12. Interests like Physicians	.062	-.455**	.152	.115	.227*

**p less than .01; one tailed test

*p less than .05; one tailed test

Table 38. Reduction in Error of Interest Estimates under Four Conditions of Counseling Compared with the Control Condition.

Interest Estimate	Mean reduction in error during counseling			
	Normal-1 Counseling minus Control	Normal-2 Counseling minus Control	Programmed Counseling minus Control	Simulated Programmed Counseling minus Control
1. Outdoor	-.009	.046	.737**	.429*
2. Mechanical	.312	.466*	.907**	.760**
3. Computational	-.353	.090	.718**	.470*
4. Scientific	.053	-.132	.340*	-.061*
5. Persuasive	.603**	.719**	1.103*	.718**
6. Artistic	.086	-.328	.410*	.243
7. Literary	.468*	.030	.562*	.729**
8. Musical	.157	-.062	.557**	.407*
9. Social Service	.418*	.021	.631*	.531*
10. Clerical	.075	-.115	.289	.179
11. Interests like Engineers	.292*	.110	.358*	.156
12. Interests like Physicians	-.165	-.682*	-.075	-.112

**p less than .01; one tailed test
*p less than .05; one tailed test

the counseled groups is greater than the control group in some cases for all counseled groups.

Table 39 compares mean reductions in error among the counseled groups. Programmed and Simulated Programmed counseling produce significantly more error reduction than the normal counseling conditions. Programmed counseling tends to produce more error reduction than Simulated Programmed counseling, but not significantly so. In the single case of Literary interest, Normal-1 counseling is superior to Normal-2 counseling.

Table 40 presents the mean error reduction for each counseling condition from the time of the pre-counseling rating until the end of the first semester in college. None of the counseling conditions result in significant reductions of error in interest estimates. Consequently it is not surprising that there is only one significant difference between counseling conditions in error reduction during this time period as indicated in Table 41. Table 42 presents the error in estimates of interest at the end of the semester for the counseled groups and the non-counseled groups. In only three instances are error scores for counseled groups significantly smaller than for non-counseled groups. These results suggest that the effect of counseling in reducing errors in estimates of interest does not persist until the end of the first semester in college as was the case with changes in errors in ability estimates.

Summary and Discussion

The analysis of the changes in estimates of abilities and interests indicate the following:

1. Significant reduction of overestimation of abilities occurs under all conditions of counseling where such reduction is appropriate. These changes

Table 39. Differences between Counseling Conditions in Reduction of Error in Interest Estimates

	Interest Estimated	Programmed minus Normal-1	Programmed minus Normal-2	Programmed minus Simulated Programmed	Simulated Programmed minus Normal-1	Simulated Programmed minus Normal-2	Normal-2 minus Normal-1
1.	Outdoor	.746**	.691**	.308	.438	.383	.055
2.	Mechanical	.597**	.493**	.149	.448*	.294	.154
3.	Computational	1.071*	.628**	.248	.823**	.380	.443
4.	Scientific	.287	.472*	.402	-.115	.070	-.185
5.	Persuasive	.500*	.384	.385	.115	.001	.116
6.	Artistic	.324	.738**	.167	.157	.571*	-.414
7.	Literary	.094	.532*	-.167	.261	.699*	-.438*
8.	Musical	.400*	.619**	.150	.250	.469*	-.219
9.	Social Service	.214	.610*	.100	.114	.510*	-.396
10.	Clerical	.214	.404	.110	.104	.294	-.190
11.	Interests like Engineers	.066	.248	.202	-.136	.046	-.182
12.	Interests like Physicians	.090	.607*	.037	.053	.570*	-.517*

**p less than .01; two tailed test
*p less than .05; two tailed test

Table 40. Reduction in Error in Interest Estimates from the Time of the Pre-Counseling Rating until the End of the First Semester in College.

Interest estimated	Mean reduction in error			
	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling
1. Outdoor	-.104	.105	-.149	.165
2. Mechanical	.026	.267	.115	.203
3. Computational	-.312	.012	.069	.013
4. Scientific	-.208	-.267	-.425	.215
5. Persuasive	.078	.023	.069	.051
6. Artistic	.117	-.198	-.241	-.291
7. Literary	-.078	-.081	-.356	-.190
8. Musical	-.143	-.105	.391	-.076
9. Social Service	.220	.050	.110	.190
10. Clerical	-.013	-.210	.320	.240

Table 41. Differences between Counseling Conditions in Reduction of Error in Interest Estimates from the Time of the Pre-counseling Rating until the Rating at the End of the First Semester in College

Interest Estimated	Programmed Minus Normal-1	Programmed Minus Normal-2	Programmed Minus Simulated Programmed	Simulated Programmed Minus Normal-1	Simulated Programmed Minus Normal-2	Normal-2 Minus Normal-1
1. Outdoor	-.045	-.254	-.314	.269	.060	.209
2. Mechanical	.089	-.152	-.088	.177	-.064	.241
3. Computational	-.381	.057	.056	.325	.001	.324
4. Scientific	-.217	-.158	-.640*	.423	.482	-.059
5. Persuasive	-.009	.046	.018	-.027	.028	-.055
6. Artistic	-.358	-.043	.050	.408	-.093	-.315
7. Literary	-.278	-.275	.166	-.112	-.109	-.003
8. Musical	.534	.496	.467	.067	.029	.038
9. Social Service	-.110	.060	-.080	-.030	.140	-.170
10. Clerical	.333	.530	.080	.253	.450	-.197

*P less than .01; two-tailed test.

Table 42. Error in Estimation of Interests at the End of the First Semester in College for Four Counseled Groups and a Non-counseled Group

Interest Estimated	Mean Error in Estimation of Interests				
	Normal-1 Counseling	Normal-2 Counseling	Programmed Counseling	Simulated Programmed Counseling	Non-counseled Students
1. Outdoor	2.48	2.26	2.67	1.94**	2.67
2. Mechanical	2.23	2.02	2.12	2.05	1.94
3. Computational	2.04	1.90	2.14	2.16	1.97
4. Scientific	1.82	2.04	2.31	1.70*	2.12
5. Persuasive	2.58	2.92	2.32	2.32	2.69
6. Artistic	2.18	2.37	2.28	2.39	2.19
7. Literary	2.32	2.37	2.56	2.80	2.55
8. Musical	2.12	1.99	1.99	1.97	1.97
9. Social Service	2.04	2.16	2.42	1.99	2.26
10. Clerical	2.57	1.92*	2.24	2.20	2.40

**p less than .01; that error is as large as for non-counseled group

*p less than .05; that error is as large as for non-counseled group are significantly larger than for a control group and persist to a significant degree until the end of the end of the first semester in college. As of the end of the semester the tendency to overestimate abilities is significantly less for students participating in counseling than for students who did not participate in counseling.

2. Significant differences among Normal-2 counseling, Programmed counseling, and Simulated Programmed counseling in amount of reduction of overestimation of abilities does not exist.

3. All counseling conditions provide significant reduction in error in ability estimates and significantly greater reduction than a control group. Greater error reduction occurs with Programmed counseling than with Normal-2 counseling and Simulated Programmed counseling. Simulated Programmed counseling is superior in one case to Normal-2 counseling.

4. All counseling conditions provide error reduction in ability estimates which persists until the end of the first semester in college and which results in an error at that time which is smaller than for a group of non-counseled students. Programmed and Simulated Programmed counseling provide greater reductions during this time than Normal-2 counseling.

5. Error reduction in interest estimates occurs for all counseled groups and this reduction is significantly greater than for a control group. Programmed and Simulated Programmed counseling produce significantly more error reduction than Normal counseling.

6. Error reduction in interest estimates does not appear to persist to a significant degree until the end of the semester. The effect of counseling would seem to be more temporary in the case of interest test information than is the case with ability test information.

The analysis of changes in self-estimates has compared mean changes for the different groups under study. In some instances there have been substantial differences between groups before counseling which might differentially affect these changes. In these cases an analysis of covariance procedure has been used to determine whether pre-counseling differences between groups would contradict the findings analyzed in terms of mean changes. In no case is there a change in the major findings which result from this analysis. This check on the significance of differences between groups in changes is necessary because the size of the pre-counseling overestimation (or error in estimate) is correlated positively (correlations between .39 and .72) with the amount of change in these self estimates.

It may be recalled that the control group total score on the School and College Ability Test was larger than for the counseled groups. The differences to be concerned about in evaluating changes are differences in pre-counseling overestimation of abilities (see Table 23) and in pre-counseling error in estimation of abilities (see Table 28). Differences for the control group as summarized in these tables are clearly comparable to differences for the counseled groups.

In Table 36 the control group pre-counseling error in estimates of interest is considerably greater in several instances than the pre-counseling errors for the counseled groups. These differences, however, would have the effect of increasing the significance of differences already present between the counseled groups and the control group.

Summary and Discussion

Before proceding to a discussion of the general results of the research, the influence of the expertness of the counselors and differences between counselors needs to be considered.

The four counselors in the project were counseling psychologists selected from the regular staff of the Student Counseling Service. All held the Ph.D. degree and had had at least ten years of experience in counseling and psychotherapy and long experience in the type of counseling interview under study. The effectiveness of Programmed counseling is, therefore, compared with the effectiveness of highly competent counselors.

Differences between counselors in counseling effectiveness in various ways needs to be considered and does occur. The results presented in regard to client evaluation of counseling indicate significant differences between counselors for some items. Similarly, changes in scholastic expectations, changes in estimates of suitability of interests and abilities, and changes in estimates of ability and interests vary in degree from one counselor to another. These variations between counselors tend to obscure somewhat the results of the study. Since each counselor is equally represented under each condition of counseling, these variations do not contribute constant error favoring one condition over another. Also, there does not seem to be any radical interaction effect in which one counselor under one condition produces results which markedly distort the results obtained from the other counselors.

The major concern regarding counselor behavior has to do with the possibility of different behavior and effectiveness under the Simulated Programmed condition of counseling. Under the Simulated Programmed condition the counselor is asked to proceed quite differently than he usually does. In order to evaluate the effects of this on counselor behavior, the tape-recorded interviews were judged in terms of a number of items for Normal-1 counseling, Normal-2 counseling, and Simulated Programmed counseling. Judges, who did not know the counselors personally, rated short segments of interviews which were randomly selected so that different segments were judged for different interviews. Eleven variables were judged on a scale ranging from 1 to 7 and the mean values for each of the three counseling conditions are listed in Table 43. The reliability based on correlations between judges is also listed for each item.

As had been expected in regard to certain items, Simulated Programmed counseling is quite different as compared with the normal counseling conditions, The nature of the procedure in Simulated Programmed counseling results in the counselor being more directive, not encouraging client talk, and the client talks less. The counselor is rated as less interested under the Simulated Programmed condition and this agrees with the client ratings of less interest as reported in Table 5. *It* seems clear that counselor behavior is different in the Simulated Programmed condition in ways other than just the order and content of the interview. The only significant difference between Normal-1 and Normal-2 counseling finds counselors under Normal-1 counseling rated more interested in the client than in Normal-2 counseling. However, clients rate counselors as just as interested in Normal-2 counseling as in Normal-1 counseling.

Another factor which needs to be considered in the interpretation of the results of the research is the degree of correlations between different criteria. In particular the analysis reveals diverging results in comparisons of Programmed

Table 43. Ratings of Counselor Behavior in the Interview under Simulated Programmed Counseling, Normal-1 Counseling and Normal-2 Counseling.

Behavior rated	Inter-judge Reliability	Normal-1 Counseling	Normal-2 Counseling	Simulated Programmed Counseling
	Mean	Mean	Mean	Mean
1. Expressive	.52	5.12	5.10	4.75*
2. Interested	.66	5.60[1]	5.22	4.97**
3. Judgmental	.52	4.32	4.44	4.08**
4. Accepting	.46	5.22	5.26	5.00*
5. Encourages client talk	.61	5.41	5.48	4.24**
6. Active	.36	5.12	5.18	5.28
7. Protective	.41	3.73	3.74	3.96*
8. Directive	.57	4.63	4.72	6.08**
9. Advises client	.43	4.80	4.99	4.63**
10. Certain, Self-assured	.50	5.29	5.35	5.35
11. Client talks freely	.62	5.28	5.11	3.91**

**p less than .01 for differences from Normal-1 or Normal-2 mean
*p less than .05 for difference from Normal-1 or Normal-2 mean
[1] p less than .01 for difference from Normal-2 mean

and Simulated Programmed counseling with normal counseling conditions. If the criteria of effectiveness is student evaluation, the normal counseling procedures are more effective, but if the criteria has to do with changes in self-estimates of abilities and interests, probable grades, needed hours of study, and suitability of abilities and interests for curricular choice, Programmed and Simulated Programmed counseling are equal to, or superior to, normal counseling in effectiveness. To put it simply, students appear to like normal counseling better but learn as much or more from Programmed counseling.

One of the factors involved in this difference is the low correlation between the two types of criteria of counseling effectiveness. Correlations were computed between student evaluations of counseling and changes in self-estimates during counseling. The correlations are low with enough significant positive correlations to indicate that the tendency is for students who revise their self-estimates (even in a negative direction) to also feel they have received help in the interview. However, student evlauation and changes in self-estimates must be considered as largely separate criteria.

As has been noted in connection with the separate studies reported previously, the groups studied were not matched perfectly on pre-counseling scores. In most cases the pre-counseling scores were so similar from one group to another as to require no correction. In thoce cases where such differences were substantial, the findings were checked with an analysis of covariance procedure. As previously indicated, there are no changes of consequence which result from these analyses.

The general results of the research project are summarized under five sections below. The first has to do with the findings in regard to the effectiveness of counseling in general in regard to the criteria used, and the other sections summarize the four comparisons of different counseling conditions outlined in the design of the study.

1. Summary of General Effectiveness of Counseling

In order for the comparison of the conditions of counseling to be most meaningful in regard to changes in the client during counseling, it is important to demonstrate that counseling is effective in regard to the criteria used in the project. The results summarized below do indicate counseling effectivenss and these criteria therefore provide valid comparisons of the different counseling conditions.

The demonstration of counseling effectiveness is also of interest in supporting previous findings of a similar kind and extending, to some degree, evidence showing that counseling is effective in changing significant attitudes toward self and self-estimates.

1. During counseling clients improve the accuracy of their estimates of abilities and interests and such effects persist in the case of ability estimates until the end of the first semester in college. This supports findings in a number of research studies cited previously.
2. Clients improve the accuracy of their estimates of probable grades, hours needed for study in college, and to some degree their estimates of suitability of abilities and interests for their curricular choice. Previous studies by Young (1955) and Robertson (1960) did not demonstrate any improvement in grade prediction following counseling. Measures used in these studies were somewhat different than in the present study. Improvement in estimates of suitability of interests and abilities for curricular choice are in agreement with findings by Chernow (1956) and Gonyea (1962).
3. Flexibility by the counselor to some degree is shown to exist for all conditions. Where flexibility was found to a significant degree, the correlations range from .20 to .50. Previous studies of flexibility were not found, and the rather low correlations suggest counselors may not be very flexible in responding to the needs of their clients in this type of interview. Further study of this aspect of counseling is needed.

2. Programmed Counseling Compared with Simulated Programmed Counseling.

The personal relationship factor is present in Simulated Programmed counseling and absent in Programmed counseling. The importance of the presence of the counselor is being examined in this comparison.

Simulated Programmed counseling is superior in the following:

1. Where the student rates the degree to which the interview was helpful with reference to each of the thirty-six problems listed in the post-counseling questionnaire, there are five items where Simulated Programmed counseling is rated as significantly more helpful than Programmed counseling. These are:
    (a) Knowing interests as related to vocational choice
    (b) Efficiency and organization in my work
    (c) Worrying, fears, anxiety
    (d) Being mature and accepting responsibility
    (e) Problems of relationship with my parents

Equal effectiveness occurs in the following:

1. Student reactions to the interview do not show any difference.
2. It was not expected that there would be differences in regard to flexibility or coverage and none was shown. Where the correlations express a mixture of coverage and help received Programmed counseling tends to yield somewhat higher correlations.
3. Equal effectiveness appears in producing significantly greater appropriate change than does a control group in regard to (a) changes in estimated grade average and hours of study expected in college; (b) changes in reduction of overestimation of abilities and (c) changes in reduction of error in estimates of interests.

Programmed counseling is superior in the following:

1. Programmed counseling produces significantly greater error reduction during counseling for three out of ten abilities estimated, but significant differences do not occur when the error reduction is evaluated from the time of the pre-counseling rating until the rating at the end of the first semester in college.
2. Programmed counseling is significantly superior in one comparison involving appropriate change in estimates of suitability of ability and interest for curricular choice.

The results are interpreted as upholding the hypothesis that learning by the student will be as adequate under Programmed counseling with the personal factor absent as under Simulated Programmed counseling with the personal factor present. Where student evaluation is involved, a slight favoring of the Simulated Programmed condition with the counselor present is tentatively indicated, but there is an equally slight favoring of the Programmed condition in some other respects. While it cannot be concluded that the personal relationship factor is totally unimportant, it can be concluded that this factor has been overemphasized in teaching, counseling, and probably psychotherapy. Consequently, teaching machine procedures are feasible in these situations where the personal relationship factor has been considered necessary.

It might be argued that the behavior of the counselor is not normal under the restrictions of the Simulated Programmed counseling condition. The comparisons of counselor behavior in Table 43 indicate that the counselor does behave differently in the Simulated Programmed condition. However, the results summarized in the comparison of Simulated Programmed counseling with normal counseling indicate that learning efficiency (measures of changes of self-estimates) is not likely to be adversely affected by these differences in counselor behavior. Client evaluations are likely to be affected as indicated in the comparisons of Simulated Programmed counseling with normal counseling.

3. Programmed Counseling Compared with Normal Counseling

In this comparison standardized, non-personal Programmed counseling is compared with unstandardized, personal counseling as in Normal-1 and Normal-2 counseling. The major interest in this comparison is the determination of the degree to which the Programmed procedure can substitute for the live teaching situation as it is normally conducted.

Normal counseling is superior in the following:

1. Both Normal-1 and Normal-2 counseling result in significantly more favorable evaluations of the interview and ratings of help received in various problems than does Programmed counseling.

2. Flexibility of coverage is significantly greater in normal counseling for one item, and flexibility involving both coverage and help is significantly greater for several items.

3. Normal-2 counseling results in significantly larger increase in expected hours of study for students who originally underestimated the the need to study before counseling.

Equal effectiveness occurs in the following:

1. Appropriate changes in expected grade average occurs in both groups.

2. Appropriate revision of estimates of suitability of abilities and interests for curricular choice are significantly greater than the control group only for Programmed counseling, but Programmed counseling is not significantly superior to normal counseling.

3. Significant reduction of overestimation of abilities occurs for both groups.

4. Coverage of problem areas in the interview appears equally adequate.

Programmed counseling is superior in the following:

1. Reduction in error of estimates of abilities and interests during counseling is larger.

2. Reduction in error of estimates of abilities persisting until the end of the first semester in college is larger.

It may be concluded that normal counseling tends to be preferred by students but that students learn as much or more from Programmed counseling. Acceptance of Programmed counseling by students is sufficient so that it may be substituted for or used as an adjunct to counseling. While normal counseling is slightly more flexible than Programmed counseling, the difference is very slight.

As indicated previously, the student evaluation criteria and the learning criteria are quite separate criteria with only low positive correlation between them.

4. Simulated Programmed Counseling Compared with Normal Counseling

In this comparison standardized Simulated Programmed counseling is compared with the non-standardized Normal-1 and Normal-2 conditions of counseling. The counselor is present in all three conditions.

Normal counseling is superior in the following:

1. General student reactions to the interview are more favorable.
2. Ratings of help received in various problem areas are more favorable.
3. Normal counseling tends to be more flexible.

Equal effectiveness occurs in the following:

1. Coverage of problems appears as adequate under one condition as another,
2. The two conditions appear equally effective in producing significant appropriate change in regard to (a) changes in estimated grade averages and hours of study expected in college; (b) reduction in over-estimation of abilities which persists until the end of the semester.

Simulated Programmed counseling is superior in the following:

1. Significant reduction in error in estimates of ability occur for Normal-2 counseling and Simulated Programmed counseling and persist until the end of the semester. In one instance Simulated Programmed counseling produces a significantly greater initial reduction and as of the end of the semester such changes are significantly greater in several instances.
2. Error reduction in interest estimates is significantly greater for several items under Simulated Programmed counseling.
3. In one case Simulated Programmed counseling produces a significantly higher correlation involving changes in estimates of suitability of abilities and interests for curricular choice.

These results are mixed, indicating superiority of normal counseling in regard to student evaluations of counseling and flexibility of counseling, but equality or superiority of Simulated Programmed Counseling in producing changes in self-estimates of abilities and interests.

It will be recalled that counselor behavior is different under Simulated Programmed counseling as indicated in Table 43. Counselors are considerably more directive, encourage client talk less, and the client does talk less than in the case with normal counseling. These differences had been predicted because of the nature of the procedure which the counselor must follow in the Simulated Programmed condition. Smaller significant differences also occur in which the counselor under the Simulated Programmed condition is less expressive, interested, judgmental, and advice-giving and more protective.

It would seem clear that the standardization of the interview required by following the order and content of the Counseling Manual results in counselor behavior which is different than in normal, non-standardized counseling.

It may be concluded that the standardization of the interview results in learning which is as adequate (changes in self-estimates) as under the non-standardized conditions, but that clients do not like standardized interviews as well as non-standarized interviews. Counselors also did not like the standardized interviews as well as non-standardized interviews. The standardization also affects counselor behavior in the interview results in learning which is as adequate (changes in self-estimates) as under the non-standardized interviews as well as non-standardized interviews. Counselors also did not like the standardized interviews as well as non-standardized interviews. The standardization also affects counselor behavior in the interview to a significant degree.

5. Normal-2 Counseling Compared with Normal-1 Counseling

In this comparison the differences which appear may be interpreted, with reservations, as related to the training experience in writing of the Counseling Manual. As previously indicated, different test norms were used for some of the ability tests so that comparisons involving these tests are not included.

Normal-2 counseling is superior in the following:

1. Signficantly more favorable reactions to the counseling interviews occur in Normal-2 counseling for three out of eight items.

Equal effectiveness occurs in the following:

1. Students reports of help received with problems favor Normal-2 counseling significantly for three items and favor Normal-1 counseling for two items.

2. Normal-2 counseling tends to result in more coverage and flexibility, but differences are small and non-significant.

3. In those cases where changes in student self-estimates may be compared, effective reduction in error of interest estimates is similar for the two conditions.

4. Changes in estimates of suitability of interests for curricular choice do not differ significantly.

In no case does Normal-1 counseling appear superior to Normal-2 counseling. On one item (See Table 43) the counselor is rated as more interested in the client by judges listening to the tape-recorded interviews, but client ratings of interest are equally high for the two conditions.

The results do not demonstrate that Normal-2 counseling is more effective than Normal-1 counseling, and therefore it cannot be said that the writing of the Counseling Manual has been shown to be a significant training experience. However, the items involving student reactions where Normal-2 counseling was judged superior are items which were stressed in the writing of the Counseling Manual. This fact plus comments from counselors involved suggest that positive training effects did occur.

Implications of the Study

The general results of the study have significant implications of both a theoretical and practical kind. With respect to teaching machine procedures generally, the assumption is supported that such procedures are sufficiently acceptable as a substitute for a live teacher that they could be widely used without fear of serious objections on the part of the recipient of such teaching. Counseling is supposed to be one of the most highly personalized forms of teaching and if serious non-acceptance or rejection were to occur, it could be expected to occur very readily in this study. The fact that the programmed counseling was not liked quite as well as customary face-to-face counseling, even though both were acceptable to a high degree, suggests that some utilization of a teacher or counselor in connection with programmed materials could add somewhat to an already high acceptability.

Of equal importance was the general finding that counseling carried out by a programmed book was as effective or more effective in changing what is ordinarily referred to as the self-concept. It has been widely assumed, and practically everything that has been written regarding counseling and psychotherapy as well, that the personal relationship is a sine quo non of effective attitudinal and personality change. This study suggests that the assumption may well be unwarranted or that a quasi-personal relationship could be conveyed by written material as effectively as by the presence of a live counselor. Whether such a result would occur if one were dealing with more serious emotional problems requiring longer term therapy is certainly still open to question. However, the evidence presented in this study does certainly throw into question some long-held beliefs regarding the essential nature of counseling and psychotherapy.

Of perhaps greatest general importance is the demonstration that counseling can be programmed. This means that a methodology has been developed which, in effect, can provide a standard counselor and perhaps, eventually, a standard therapist which can be specifically and concretely modified at the will of the experimenter. This simplification of one part of the dyad involved in individual counseling or therapy should make the control problem involved in many different kinds of research in this area a much easier matter.

On the very practical side, a programmed counseling book such as has been developed in this study, or some modification of it, could do much to alleviate the critical shortage of trained counselors at a national level. As indicated at the outset of this report, the utilization of programmed material of this kind could at least free counselors to devote their time to the kinds of problems which perhaps only living counselors can deal with effectively.

Looking toward the future, it seems clear that a next step ought to be an investigation of programmed psychotherapy as compared with normal psychotherapy. Prior to the present study, such a possibility could have been looked on with considerable doubt and misgiving. Now that it has been demonstrated that counseling can be carried on effectively by means of a programmed book, it does not seem to be such a far step to attempt this with psychotherapy. There is some evidence that counselors are not nearly as flexible in their approach to client problems as had been assumed previously. Perhaps psychotherapists, too, utilize a fairly finite number of both concepts and procedures which are of practical significance with respect to both psycho-diagnosis and therapeutic effectiveness. If such is the case, there is every reason to hope that it would be possible to construct a sufficiently branching type of programmed material that even the most complicated therapeutic problem might be worked out by programmed materials alone or by a procedure which would make minimal demands on a therapist's time.

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